



**6712-01**

**FEDERAL COMMUNICATIONS COMMISSION**

**47 CFR Parts 1, 2, 25, 27, and 101**

**[WT Docket Nos. 12-70 and 04-356; ET Docket No. 10-142; FCC 12-151]**

**Service Rules for Advanced Wireless Services in the 2000–2020 MHz and 2180–2200 MHz Bands, etc.**

**AGENCY:** Federal Communications Commission.

**ACTION:** Final rule; order of proposed modification.

**SUMMARY:** In this document, the Federal Communications Commission (“Commission”) increases the Nation’s supply of spectrum for mobile broadband by adopting flexible use rules for up to 40 megahertz of spectrum in the 2 GHz band (2000-2020 MHz and 2180-2200 MHz), which we term the AWS-4 band. In so doing, we carry out a recommendation in the National Broadband Plan that the Commission enable the provision of stand-alone terrestrial services in the 2 GHz Mobile Satellite Service (MSS) spectrum band. Specifically, we remove unnecessary regulatory barriers to mobile broadband use of this spectrum, and adopt service, technical, and licensing rules that will encourage innovation and investment in mobile broadband and provide a stable regulatory regime in which broadband deployment can develop.

**DATES:** Effective **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, except amendments to 47 CFR 1.949, 27.14, 27.17, 27.1131, 27.1134, 27.1136, 27.1166, 27.1168, 21.1170, 101.69, and 101.73(d), which contain new or modified information collection requirements that require approval by the Office of Management and Budget (OMB). The Commission will publish a document in the Federal Register announcing the effective date of those sections.

**ADDRESSES:** Federal Communications Commission, 445 12th Street, SW, Washington, DC 20554. A copy of any comments on the Paperwork Reduction Act information collection requirements contained herein should be submitted to Judith B. Herman, Federal Communications Commission, Room 1-B441, 445 12<sup>th</sup> Street, SW, Washington, DC 20554 or via the Internet at [Judith.B.Herman@fcc.gov](mailto:Judith.B.Herman@fcc.gov).

**FOR FURTHER INFORMATION CONTACT:** Kevin Holmes, Wireless Telecommunications Bureau, Broadband Division, at (202) 418-BITS or by email at [Kevin.Holmes@fcc.gov](mailto:Kevin.Holmes@fcc.gov). For additional information concerning Paperwork Reduction Act information collection requirements contained in this document, contact Judith B. Herman at (202) 418-0214, or via the Internet at [PRA@fcc.gov](mailto:PRA@fcc.gov).

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's Report and Order and Order of Proposed Modification, FCC 12-151, adopted on December 11, 2012, and released on December 17, 2012. The full text of this document is available for inspection and copying during normal business hours in the FCC Reference Information Center, Room CY-A257, 445 12th Street, SW, Washington, DC 20554. The complete text of the Report and Order and Order of Proposed Modification and related Commission documents may be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc. (BCPI), Portals II, 445 12th Street, SW., Room CY-B402, Washington, DC 20554, (202) 488-5300 or (800) 387-3160, contact BCPI at its website: <http://www.bcpweb.com>. When ordering documents from BCPI, please provide the appropriate FCC document number, for example, FCC 12-151. The complete text of the Report and Order and Order of Proposed Modification is also available on the Commission's Website at [http://wireless.fcc.gov/edocs\\_public/attachment/FCC-12-151A1doc](http://wireless.fcc.gov/edocs_public/attachment/FCC-12-151A1doc). This full text may also be downloaded at: <http://wireless.fcc.gov/releases.html>. Alternative formats (computer diskette, large print, audio cassette, and Braille) are available by contacting Brian Millin at (202) 418-7426, TTY (202) 418-7365, or via e-mail to [bmillin@fcc.gov](mailto:bmillin@fcc.gov).

## **I. INTRODUCTION**

1. With this Report and Order, we increase the Nation's supply of spectrum for mobile broadband by adopting flexible use rules for 40 megahertz of spectrum in the 2 GHz band (2000-2020 MHz and 2180-2200 MHz), which we term the AWS-4 band. In so doing, we carry out a recommendation in the National Broadband Plan that the Commission enable the provision of stand-alone terrestrial services in the 2 GHz Mobile Satellite Service (MSS) spectrum band, thus dramatically

increasing the value of this spectrum to the public. Specifically, we remove regulatory barriers to mobile broadband use of this spectrum, and adopt service, technical, and licensing rules that will encourage innovation and investment in mobile broadband and provide certainty and a stable regulatory regime in which broadband deployment can rapidly occur.

2. To create a solid and lasting foundation for the provision of terrestrial services in this spectrum and to make this spectrum available efficiently and quickly for flexible, terrestrial use, such as mobile broadband, we will assign the spectrum to the incumbent MSS operators. Thus, together with this Report and Order, we issue an Order of Proposed Modification, proposing to replace the incumbent MSS operators' Ancillary Terrestrial Component (ATC) authority with full flexible use terrestrial authority. Additionally, we decline to adopt the alternative band plan proposals presented in the AWS-4 Notice of Proposed Rulemaking and Notice of Inquiry ("AWS-4 NPRM" and "AWS-4 NOI"), 77 FR 22720, April 17, 2012, and 77 FR 22737, April 17, 2012, including shifting the AWS-4 uplink spectrum up five or ten megahertz or further exploring the larger and more complex 2 GHz Extension Band Concept.

## **II. BACKGROUND**

### **A. The Growing Spectrum Demands of Mobile Broadband Services**

3. Demand for wireless broadband services and the network capacity associated with those services is surging, resulting in a growing demand for spectrum to support these services.

### **B. The Spectrum Act**

4. In February 2012, Congress enacted Title VI of the Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112-96, 126 Stat. 156 (2012) (the "Spectrum Act"). The Spectrum Act includes several provisions to make more spectrum available for commercial use, including through auctions, and to improve public safety communications. Among other things, the Spectrum Act requires the Commission, by February 23, 2015, to allocate the 1915-1920 MHz band and the 1995-2000 MHz band (collectively, the "H Block") for commercial use, and to auction and grant new initial licenses for

the use of each spectrum band, subject to flexible use service rules. Congress provided, however, that if the Commission determined that either of the bands could not be used without causing harmful interference to commercial licensees in 1930-1995 MHz (PCS downlink), then the Commission was prohibited from allocating that specific band for commercial use or licensing it. See 47 U.S.C. 1451(b)(4). Additionally, sections 6401(f) and 6413 of the Spectrum Act specify that the proceeds from an auction of licenses in the 1995-2000 MHz band and in the 1915-1920 MHz band shall be deposited in the Public Safety Trust Fund and then used to fund the Nationwide Public Safety Broadband Network (“FirstNet”). See 47 U.S.C. 309(j)(8)(D)(iii), 1457. The H block spectrum could be the first spectrum specified by the Spectrum Act to be licensed by auction, and thus could represent the first inflow of revenues toward this statutory goal.

5. In March 2012, the Commission adopted the AWS-4 NPRM, which consisted of a Notice of Proposed Rulemaking and Notice of Inquiry. In the AWS-4 NPRM, the Commission proposed to increase the Nation’s supply of spectrum for mobile broadband by removing barriers to flexible use of spectrum currently assigned to the MSS. The Commission proposed terrestrial service rules for the 2 GHz band that would generally follow the Commission’s part 27 flexible use rules, modified as necessary to account for issues unique to the particular spectrum bands. The proposed rules were designed to provide for flexible use of this spectrum, to encourage innovation and investment in mobile broadband, and to provide a stable regulatory environment in which broadband deployment could develop. The proposed rules also included aggressive build-out requirements and concomitant penalties for failure to build out designed to ensure timely deployment of wireless, terrestrial broadband in the band. Additionally, in the Notice of Inquiry, the Commission sought comment on potential ways to free up additional valuable spectrum to address the Nation’s growing demand for mobile broadband spectrum, including through examination of alternative band plans incorporating the Federal 1695-1710 MHz band.

6. Comments on the AWS-4 NPRM were due by May 17, 2012 and reply comments were due by June 1, 2012. Thirty-four comments and twenty-one reply comments were filed in response to the AWS-4 NPRM. In addition, as permitted under our rules, there have been ex parte presentations.

### **III. REPORT AND ORDER: AWS-4**

7. In this AWS-4 Report and Order, we build on the Commission's recent actions to increase the availability of spectrum by enabling terrestrial mobile broadband service in 40 megahertz of spectrum in the 2000-2020 MHz and 2180-2200 MHz spectrum bands. As explained below, we adopt AWS-4 terrestrial service, technical, and licensing rules that generally follow the Commission's Part 27 flexible use rules, modified as necessary to account for issues unique to the AWS-4 bands. First, we establish 2000-2020 MHz paired with 2180-2200 MHz as the AWS-4 band plan.

8. Second, we adopt appropriate technical rules for operations in the AWS-4 band. This includes rules governing the relationship of the AWS-4 band to other bands. For example, as explained below, we require the licensees of AWS-4 operating authority to accept some limited interference from operations in the adjacent upper H block at 1995-2000 MHz, and impose more stringent out-of-band emission (OOBE) limits and power limits on these licensees to protect future operations in 1995-2000 MHz. With respect to adjacent operations at 2200 MHz, we permit operator-to-operator agreements to address concerns regarding interference and also establish default rules to protect against harmful interference. Further, we require licensees of AWS-4 authority to comply with the OOBE limits contained in a private agreement entered into with the Global Positioning Systems (GPS) industry.

9. Third, mindful that AWS-4 spectrum is now allocated on a co-primary basis for Mobile Satellite and for terrestrial Fixed and Mobile services and that MSS licensees already have authorizations to provide service in the band, we determine that the AWS-4 rules must provide for the protection of 2 GHz MSS systems from harmful interference caused by AWS-4 systems. In addition, consistent with our determination below to grant AWS-4 terrestrial operating authority to the incumbent 2 GHz MSS

licensees, we propose to assign terrestrial rights by modifying the MSS operators' licenses pursuant to section 316 of the Communications Act.

10. Fourth, we adopt performance requirements for the AWS-4 spectrum. Specifically, licensees of AWS-4 operating authority will be subject to build-out requirements that require a licensee to provide terrestrial signal coverage and offer terrestrial service to at least 40 percent of its total terrestrial license areas' population within four years, and to at least 70 percent of the population in each of its license areas within seven years, and will be subject to appropriate penalties if these benchmarks are not met.

11. Fifth, we adopt a variety of regulatory, licensing, operating, and relocation and cost sharing requirements for licensees of AWS-4 operating authority.

12. Sixth, we eliminate the ATC rules for the 2 GHz MSS band and propose to modify the 2 GHz MSS operators' licenses to eliminate their ATC authority.

13. Seventh, consistent with the scope of the AWS-4 NPRM, we take no action on the Commission's ATC rules for other MSS bands.

14. In reaching these conclusions below, we consider other possible outcomes for this spectrum, proposed in the AWS-4 NPRM or by commenters in response thereto, but ultimately decline to adopt them. For example, we decline to adopt any of the proposed alternative band plans, including shifting the AWS-4 uplink spectrum or pursuing the 2 GHz Extension Band Concept that was set forth in the AWS-4 NOI. Similarly, we reject calls to reduce or take back spectrum allocated to the 2 GHz MSS licensees and decline to assign AWS-4 terrestrial rights through an auction. We also decline to adopt the interim build-out benchmarks and their associated penalties as proposed in the AWS-4 NPRM. Further, we decline to impose restrictions on transferring or assigning AWS-4 spectrum beyond the general requirements applicable to Wireless Radio Service spectrum generally. Nor do we impose any roaming or wholesale obligations beyond those contained in the Commission's rules, or "use it or share it"

obligations. Rather, the rules we adopt today represent the Commission's efforts to make more spectrum available for terrestrial flexible use, including for mobile broadband, in the public interest, without imposing undue restrictions on the use of the spectrum.

15. We emphasize that we find the rules we adopt and the actions we take and propose to take today to be in the public interest based on the totality of the facts and circumstances before us considered as a whole.

**A. AWS-4 Band Plan**

16. Band plans establish parameters and provide licensees with certainty as to the spectrum they are authorized to use. As explained below, based on the record before us, we adopt as the AWS-4 band plan 2000-2020 MHz paired with 2180-2200 MHz, configured in two consistently-spaced 10 megahertz blocks. Further, we will license the blocks on an EA basis.

**1. AWS-4 Frequencies and Paired Spectrum (uplink/downlink)**

17. We adopt the band plan and spectrum pairing proposed in the AWS-4 NPRM, and establish the AWS-4 spectrum band as 2000-2020 MHz uplink band paired with 2180-2200 MHz downlink band.

**a. AWS-4 Frequencies**

18. We establish the AWS-4 band as 2000-2020 MHz and 2180-2200 MHz. After considerable analysis of the facts and the record before us, we conclude that this band plan will result in the most efficient use of spectrum for mobile broadband and, when paired with appropriate technical rules, will not impair the future use of the 1995-2000 MHz band, thereby enabling us to best fulfill our obligations under the Spectrum Act and our general obligation to maximize the benefits of the spectrum for the public interest.

19. Establishing these frequencies for AWS-4 terrestrial spectrum is the culmination of several years of Commission effort exploring this path. In July 2010, the Commission adopted the MSS NPRM and NOI in which it proposed to add co-primary Fixed and Mobile allocations for this spectrum, 75 FR 49871, Aug. 16, 2010. In April 2011, the Commission added these terrestrial allocations, thereby “lay[ing] the foundation for more flexible use of the band . . . [and] promoting investment in the development of new services and additional innovative technologies,” 76 FR 31252, 31254, May 31, 2011. In that order, the Commission also stated its intent to initiate a rulemaking—this proceeding—to explore “service rule changes that could increase investment and utilization of the band in a manner that serves the public interest . . . [including examining] potential synergies with neighboring bands,” 76 FR 31254, May 31, 2011. The record before us demonstrates nearly unanimous support to add terrestrial rights to the 2 GHz MSS band generally.

20. We adopt this band plan because, of the options available to us, it should enable the use of the spectrum for mobile broadband in the most expeditious and efficient manner. Setting the AWS-4 band as 2000-2020 MHz and 2180-2200 MHz mirrors the existing 2 GHz MSS band. Because the existing 2 GHz MSS licensees will have AWS-4 operating authority, under this band plan they will be able to offer both terrestrial and satellite service using the same spectrum. In contrast, because the 2020-2025 MHz band is not allocated for MSS, shifting the AWS-4 band up to include this spectrum would necessarily create a mismatch between the spectrum available to provide terrestrial service and the spectrum available to provide satellite service.

21. We decline to adopt our alternative proposals to shift the spectrum in the lower portion of the AWS-4 band plan. We acknowledge that setting the lower AWS-4 band at 2000-2020 MHz gives rise to potential interference issues between the AWS-4 band and the 1995-2000 MHz band (AWS-2 upper H block). This raises particular concerns because, as discussed below, Congress has directed the Commission to assign licenses in the 1995-2000 MHz band through a system of competitive bidding—a system that, among other things, promotes efficient and intensive use of that spectrum and recovers a



portion of the value of the spectrum resource. Regulatory actions that might compromise the utility of the 1995-2000 MHz band cannot easily be reconciled with the purposes of the Spectrum Act's mandate that this band be licensed through a system of competitive bidding. We find, however, that the tension between this mandate and the public interest benefits of the band plan we are adopting can be resolved by promulgating appropriate technical rules for the AWS-4 band, as described below.

22. Because we resolve these interference issues through technical rules, we decline to adopt any of the three alternative band plans proposed in the AWS-4 NPRM: (1) 2005-2025 MHz paired with 2180-2200 MHz; (2) 2010-2025 MHz paired with 2180-2200 MHz; and (3) the alternative NOI proposal, as well as any of the alternative band plan proposals presented by commenters. We decline to shift the band because we find that the technical rules we adopt below offer a better solution than shifting the band. Further, nothing in the record has convinced us that the 2020-2025 MHz band cannot be put to productive use in the future. We decline to pursue the alternative NOI proposal for the reasons discussed in section VI. below. Finally, we decline at this time to adopt more aggressive proposals that would reduce the amount of MSS spectrum or return licenses to the Commission, because we believe the approach adopted herein will lead to faster and more efficient terrestrial deployment in the AWS-4 band.

#### **b. Paired Spectrum**

23. For the AWS-4 band plan, we adopt the same uplink and downlink pairing designations as those currently used in the 2 GHz MSS band. Specifically, for AWS-4 spectrum, the lower band (2000-2020 MHz) will be the uplink band and the upper band (2180-2200 MHz) will be the downlink band. As we noted in the AWS-4 NPRM, “[a]dopting the same uplink/downlink pairing approach for AWS-4 as for 2 GHz MSS may facilitate the continued use of existing satellites for MSS,” 77 FR 22722, April 17, 2012. Thus, it is consistent with our determination, infra, to require AWS-4 operators to protect 2 GHz MSS operations from harmful interference. Stated otherwise, having the AWS-4 band parallel the spectrum pairing of the 2 GHz MSS band, in terms of their uplink and downlink designations, will minimize the possibility that AWS-4 operations could interfere with 2 GHz MSS operations and will offer

the greatest opportunity for synergies between the two mobile services. Our finding is supported by the record and no commenter objected to this pairing of uplink and downlink spectrum.

## **2. Spectrum Block Size and Duplex Spacing**

24. We determine to license the AWS-4 spectrum in two paired 10 + 10 megahertz blocks, but, in doing so, we adopt a consistent (i.e., non-variable) duplex spacing. The AWS-4 band will therefore consist of two paired 10 + 10 megahertz blocks as follows: Block A pairs 2000-2010 MHz with 2180-2190 MHz and Block B pairs 2010-2020 MHz with 2190-2200 MHz.

25. Block Size. We adopt 10 megahertz blocks as the block size for the AWS-4 band. This block size has several advantages. First, it mirrors the current MSS/ATC block size. Second, spectrum bands of this size will encourage technologies that utilize wider bandwidth, and will encourage the adoption of and use of next generation technologies. This is particularly the case in a band, such as this one, where large contiguous blocks are readily configurable. We expect that use of wide, contiguous blocks of spectrum will support continued innovation and deployment of mobile broadband technologies, such as Long Term Evolution (“LTE”), to meet higher data rates and wider bandwidths. Additionally, 10 + 10 megahertz blocks allow for the possibility that multiple providers may make use of the spectrum (including through the operation of secondary markets), but can also be used as a single 20 + 20 megahertz block if a single operator controls both blocks in a market. The record supports both the 10 + 10 MHz blocks and the ability for a single operator to combine both blocks into a 20 + 20 MHz block. Further, no one submitted comments in opposition to the 10 + 10 block size for AWS-4 terrestrial licenses. However, AT&T argued that the MSS allocation be reduced to one single 10 + 10 MHz block. We decline to pursue AT&T’s request that we reallocated part of the 2 GHz band. As the Commission stated in 2011 in the 2 GHz Band Co-Allocation Report and Order when adding the co-primary fixed and mobile allocations to the band, “MSS remains co-primary in the 2 GHz MSS band...Both of the MSS licensees in the band will continue to operate under the terms of their existing licenses,” 76 FR 31252, 31254, May 31, 2011. Thus, to support the continued innovation of mobile broadband technologies by

providing wide, contiguous channels, we adopt our proposal to license the AWS-4 spectrum in paired 10 + 10 megahertz blocks.

26. In the AWS-4 NPRM, the Commission proposed that, in the event that a single licensee holds both the A and the B Blocks, that licensee should be permitted to combine the blocks into one paired 20 + 20 megahertz block. We adopt this proposal. We find it consistent with the record, with our decision to permit flexible use of AWS-4 spectrum, and with our technical findings below. The rules adopted herein will allow a licensee holding all paired 20 + 20 megahertz of AWS-4 spectrum to make use of that spectrum as it sees fit, so long as such use otherwise complies with the Commission's rules, including the technical and interference rules established herein. Thus, we will provide a licensee holding AWS-4 terrestrial authority with the opportunity to design its network in a manner that enables it to best respond to its business and technical needs. For example, combining these blocks may enable a licensee to benefit from establishing larger channel bandwidths, such as paired 15 + 15 megahertz or 20 + 20 megahertz blocks, which can result in greater spectral efficiency and network capacity and, consequently, improved customer experiences.

27. Duplex Spacing. We find that the paired 10 megahertz blocks should operate with a consistent duplex spacing. Thus, block A will pair 2000-2010 MHz with 2180-2190 MHz and Block B will pair 2010-2020 MHz with 2190-2200 MHz. We license the AWS-4 spectrum such that duplex spacing of the spectrum blocks will be uniform. Although some commenters support using the existing 2 GHz MSS duplex spacing for AWS-4, we concur with other parties, such as AT&T, that to "facilitate the deployment of terrestrial AWS-4 service, the Commission should adopt an A-B/A-B configuration, similar to the consistent duplex spacing used in other AWS and 3GPP standards." AT&T Comments to WT Docket No. 12-70, ET Docket No. 10-142, WT Docket No. 04-356, at page 5. Further, this is consistent with the recent change by 3<sup>rd</sup> Generation Partnership Project ("3GPP") in band class 23 to shift from an A-B/B-A pairing to an A-B/A-B pairing. Thus, to promote uniformity among mobile wireless

bands and to maintain consistency with standards setting bodies, we find it appropriate to license AWS-4 spectrum bands in A-B/A-B paired blocks.

28. Changes to MSS Duplex Spacing. Currently, the two MSS licenses in the band are arranged with one license authorized to use of 2000-2010 MHz as uplink paired with 2190-2200 MHz as downlink, and the other authorized to use 2010-2020 MHz uplink paired with 2180-2190 MHz downlink. That is, there are effectively two blocks, each 10 + 10 megahertz, paired A-B/B-A. As discussed above, we are establishing the AWS-4 blocks in an A-B/A-B pairing, rather than an A-B/B-A pairing. There remains, however, a need to coordinate between MSS and AWS-4 operations. In fact, as discussed below, we have found that the assignment of AWS-4 terrestrial use rights must be made to the existing MSS authorization holders to allow coordination and prevention of harmful interference. Therefore, we determine to also align the MSS blocks with the AWS-4 blocks. Because, as AT&T states, the MSS satellites should be “capable of providing service under a modified A-B/A-B configuration,” this rearrangement should be feasible and not present a significant burden on the MSS licensees. Consequently, we adopt a rearrangement of the 2 GHz MSS blocks as follows: the first block shall be 2000-2010 MHz uplink paired with 2180-2190 MHz downlink, and the second block shall be 2010-2020 MHz paired with 2190-2200 MHz. This rearrangement results in the first MSS block aligning with the AWS-4 A block, and the second MSS block aligning with the AWS-4 B block.

29. Interoperability. The AWS-4 NPRM also sought comment on whether the Commission should take action to ensure that equipment for the AWS-4 band is interoperable across both paired blocks. No commenters discussed this issue. As the AWS-4 spectrum will be licensed to the existing 2 GHz MSS licensees, and the commenter controlling both licensees has stated its desire to operate across the entire band, we anticipate that its operations would result in devices that operate across the entire AWS-4 band. We therefore take no action at this time on this issue. We observe, however, that the Commission is investigating interoperability issues in other contexts. We continue to believe that interoperability is an important aspect of future deployment of mobile broadband services. We will

closely examine any actions taken that have the potential to undermine the development of interoperability in the AWS-4 band and may take action on this issue if it is warranted in the future.

### **3. Geographic Area Licensing**

30. We will assign terrestrial spectrum use rights in the AWS-4 band on a geographic-area basis. A geographic-area licensing approach is well suited for the types of fixed and mobile services we expect to be deployed in this band. Further, geographic-area licensing will maintain consistency between the AWS-4 band and the AWS-1 band.

31. Having examined the record, which is mixed on this issue, we will award terrestrial rights for the AWS-4 spectrum on an Economic Area (“EA”) basis. We adopt an EA licensing area scheme. We do so for four reasons. First, addressing the concerns of those seeking larger license areas, EA license areas are a useful and appropriate geographic unit that Commission has used for similar bands. Notably, AWS-1 Blocks B and C spectrum is licensed on an EA basis. EA licenses can be aggregated up to larger license areas, including into MEAs or larger units, including nationwide. Any such aggregation, however, would not relieve a licensee from obligations that are based on the original EA license area, such as, importantly, build-out requirements. Second, EA-based licensing is consistent with the other requirements adopted herein, most notably the performance requirements discussed below, which establish EA-based build-out requirements. Third, licensing AWS-4 on an EA basis best balances the Commission’s goals of encouraging the offering of broadband service both to broad geographic areas and to sizeable populations. For example, as one commenter notes, licensing in smaller geographic blocks averts the phenomenon of huge tracts of licensed territory being left unserved. Finally, contrary to one commenter’s unsubstantiated claim, we do not believe that licensing on an EA basis impairs nationwide operations. Indeed, other than the PCS G block, all other major terrestrial spectrum bands are licensed in discrete geographic areas, including AWS-1, several blocks of which are licensed on an EA-basis. These bands have not proven unduly difficult for licensees to administer. Consequently, because EAs allow licensees to build their geographic coverage as needed, are consistent with the other requirements

established for this band, and promote the Commission's goal of widespread broadband service, we adopt the proposal in the AWS-4 NPRM to assign AWS-4 spectrum rights on an EA basis.

32. Gulf of Mexico. In the AWS-4 NPRM, the Commission sought comment on how to include the Gulf of Mexico in its licensing scheme. The Commission questioned if the Gulf should be licensed in a similar fashion as the Upper 700 MHz band, where the Gulf was included as part of larger service areas, or whether the Gulf should be licensed separately. The Commission has addressed the issue of licensing the Gulf of Mexico in other proceedings and we will follow the established policy on this issue. Therefore, because we are adopting an EA-based licensing scheme, and the Commission received no comments directly addressing this issue, we will license the Gulf of Mexico as EA licensing area 176. As we did in licensing other Part 27 services, the Gulf of Mexico service area is comprised of the water area of the Gulf of Mexico starting 12 nautical miles from the U.S. Gulf coast and extending outward.

#### **B. Technical Issues**

33. Pursuant to its statutory direction in the Communications Act, the Commission adopts rules for commercial spectrum in a manner that furthers and maximizes the public interest. For example, allowing spectrum to be repurposed for its highest and best use serves this end as more efficient spectrum use, among other things, spurs investment and benefits consumers through better performance and lower prices. Deciding how best to further and maximize the public interest, moreover, is not an assessment that is made in a vacuum. Notably, when developing policies for a particular band, the Commission looks at other bands that might be affected, particularly the adjacent bands. In revising its rules, therefore, the Commission often must strike a balance among competing interests of adjacent bands, and between sometimes competing public interest considerations.

34. The rules for one band, particularly the interference protection rules, affect the use and value of other bands and thus the public interest benefits that can be realized through the use of those adjacent bands. Moreover, the public interest analysis, and the balancing of interests across bands, does not necessarily reduce to an inquiry about the amount of spectrum that is or could be made available in

the relevant bands. Not all spectrum use has equal value or leads to the same public interest benefits. For example, as explained below, wireless providers tend to use more downlink than uplink spectrum. Therefore, it is not clear that the loss of some uplink spectrum would diminish the value of, or the public's interest in, a large paired band when compared to the value that would be created in enabling a smaller full power downlink band. Indeed, the public interest benefits of a fully usable new downlink spectrum band likely are substantially greater than a fully usable equal sized addition of uplink spectrum that is a part of a larger band. The balancing between adjacent bands may be weighted further if one band will enable the combination of spectrum bands, including the aggregation of smaller bands, while the other band does not.

35. In this section, we adopt the technical operating rules (e.g., interference rules) that will govern AWS-4 operations and licensees. In general, our aim in establishing technical rules is to maximize the flexible use of spectrum while appropriately protecting operations in neighboring bands. We also specifically consider here our statutory obligations set forth in the Spectrum Act with respect to the 1995-2000 MHz band. We base the technical rules we adopt below on the rules for AWS-1 spectrum, with specific additions or modifications designed to protect operations in adjacent bands from harmful interference. These bands include (1) the existing 1930-1995 MHz broadband PCS service; (2) future services operating in the 1995-2000 MHz band; and (3) Federal operations in the 2200-2290 MHz band.

## **1. OOB Limits**

36. In this section we adopt interference rules for operations between AWS-4 blocks within the AWS-4 band and between AWS-4 blocks and adjacent and nearby bands. In the event that, once individual systems are deployed and operational, it is determined that these limitations do not prevent an AWS-4 fixed or mobile transmitter from causing harmful interference, we shall, at our discretion, require the licensee of that transmitter to provide greater emission attenuation consistent with the typical treatment of Part 27 services.

**a. Interference Between Services in Adjacent AWS-4 Blocks**

37. We require fixed and mobile transmitters operating in 2000-2020 MHz and 2180-2200 MHz bands to attenuate emissions outside the licensed channels in these bands by  $43 + 10 \log_{10}(P)$  dB, unless all affected parties agree otherwise. This limit of  $43 + 10 \log_{10}(P)$  dB is consistent with other CMRS bands, including the AWS-1 band that forms the basis for many of the technical rules we adopt herein. This specific emission limit, as well as the principle of adopting the same limits across multiple CMRS bands, is supported by the record. Further, we disagree with the assertion that permitting unified operations in the band makes it unnecessary for us to establish emissions levels between adjacent block AWS-4 operations. We observe, however, that to the extent a service provider establishes unified operations across the AWS-4 blocks, that operator may choose not to observe this emission level strictly between its adjacent block AWS-4 licenses in a geographic area, so long as it complies with other Commission rules and is not adversely affecting the operations of other parties by virtue of exceeding the emission limit.

38. Additionally, we adopt the measurement procedures found in § 27.53(h) to AWS-4 mobile and base stations. Specifically, we require a measurement bandwidth of 1 MHz or greater, with an exception allowing a smaller measurement bandwidth within the first megahertz outside the channel. In sum, after reviewing the record and finding it supports the Commission's proposals, we conclude that the potential benefits of our proposals would outweigh any potential costs and adopt the proposed OOB limit and measurement procedures.

**b. Interference with Services in Adjacent and Other Bands**

39. Having established interference rules for operations between adjacent AWS-4 blocks, we next set rules for AWS-4 operations relative to operations in adjacent and nearby spectrum bands. In so doing, wherever possible, we establish rules that permit flexible use of the AWS-4 band, while effectively protecting adjacent and nearby bands from harmful interference resulting from AWS-4 emissions. As a



preliminary matter, we observe that the Commission frequently applies a minimum attenuation level of  $43 + 10 \log_{10}(P)$  dB to protect operations in adjacent frequency bands.

**(i) Interference with operations below 1995 MHz**

40. We conclude that fixed and mobile transmitters operating in the 2000-2020 MHz AWS-4 uplink band must attenuate emissions below 1995 MHz by  $70 + 10 \log_{10}(P)$  dB. We also apply the existing measurement procedure contained in § 27.53(h) of our rules, whereby a measurement bandwidth of 1 MHz or greater is required, with an exception allowing a smaller measurement bandwidth in the first megahertz outside the channel. This emission level is supported by the record. AT&T, CTIA, Sprint, and T-Mobile all support the need to protect PCS operations below 1995 MHz. DISH, Greenwood, Motorola, Nokia, and Sprint all support our proposed OOB limit of  $70 + 10 \log_{10}(P)$  dB below 1995 MHz for AWS-4 emissions. No commenters opposed this OOB limit. We observe that DISH and Sprint have disagreed as to the technical standards that the 3GPP had established to protect operations in 1990-1995 MHz from interference from 2 GHz MSS/ATC operators. This disagreement was resolved on November 13, 2012 in 3GPP as -40 dBm/MHz, equivalent to  $70 + 10 \log_{10}(P)$  dB, although DISH has expressed concern that Sprint might reopen this issue. We decline to insert ourselves into this dispute before an external standards organization. Given the record before us, we therefore conclude that the potential benefits of our proposals would outweigh any potential costs and adopt this out-of-band emission limit below 1995 MHz for all fixed and mobile transmitters operating in the AWS-4 uplink band.

**(ii) Interference with operations in 1995-2000 MHz**

41. General Considerations. In considering the rules that should govern potential interference between the spectrum being repurposed—here, AWS-4 spectrum—and the adjacent bands, to maximize the public interest, the Commission must consider the value of potential uses in both bands. We are thus generally disinclined to treat an adjacent band as a permanent guard band, which, by definition, would preclude most use of that spectrum for the provision of full flexible use service to the

public, or as a limited use band, which would have considerably less economic value than would a full flexible use band.

42. Here, one of the adjacent bands—the 1995-2000 MHz portion of the H block—is not in use today, but Congress has directed that it be licensed via a system of competitive bidding by February 2015. As explained below, this adjacent band raises particularly difficult technical issues because it may result in an uplink band (2000-2020 MHz) adjacent to a downlink band (1995-2000 MHz). In 2004, the Commission determined to pair the 1915-1920 MHz band with the 1995-2000 MHz band, and contemplated that the lower band would be used for mobile transmissions. In particular, the Commission determined that these bands were comparable to the 1910-1915 MHz and 1995-2000 MHz PCS bands, which are used as uplink and downlink bands, respectively. The technical rules we adopt today, therefore, are designed to protect future operations in the 1995-2000 MHz band from harmful interference by future operations in the repurposed AWS-4 band. Moreover, enabling full flexible use of the 1995-2000 MHz band may lead to the pairing of this band with the 1915-1920 MHz band, which would thereby maximize the public interest benefit of both of these five megahertz bands. Furthermore, we recognize that in establishing rules that allow the 1995-2000 MHz spectrum band to be put to its highest and best use, we also further Congress’s objectives related to the use of public safety broadband spectrum in the 700 MHz band. The Spectrum Act directs that the proceeds from the auction of licenses in the 1995-2000 MHz band be deposited into the Public Safety Trust Fund, which will be used to fund FirstNet.

43. In considering the rules that should govern potential interference between the 1995-2000 MHz band, which the Commission envisions as a downlink band, and the adjacent AWS-4 uplink band, the Commission must consider the public interest benefits associated with potential uses in both bands, including, but not limited to, the net effect on the economic values of these bands, and adopt technical rules accordingly. The public interest in the 1995-2000 MHz band is almost certainly maximized if the band is used as an additional PCS band. DISH, conversely, argued first that the Commission should effectively treat the 1995-2000 MHz band as a guard band, which would eliminate most of its value.

DISH then argued that the H block should not be made available for full power use, and instead could be auctioned for air-to-ground or small cell use, although both of these uses would, in our assessment, have considerably less economic value and other public interest benefits than an additional PCS downlink band. Limiting the use of the band to air-to-ground operations would be inconsistent with the Spectrum Act's direction to license the 1995-2000 MHz band for flexible use. Additionally, both the air-to-ground and small cell proposals, by precluding the possibility of full power cellular operations, would restrict the value of the band in a way that we believe does not promote the public interest in this particular instance given specific characteristics of the band and the available alternative of higher power use. All four nationwide wireless providers have broadband PCS spectrum, as do regional and rural providers, and any of these providers could use additional PCS spectrum to expand capacity. One analyst projected that the value of the paired H block would be \$2-3 billion, which implies a price of at least \$0.67-\$1.00 per MHz POP, or \$1-\$1.5 billion for the downlink band. We note that economists frequently consider it a rule of thumb that the public benefit of a licensed spectrum band typically equates to about ten times its value at auction. Although as a matter of practice the Commission does not predict auction prices, we reference these figures as an indicator of the economic value or public benefit that could be derived from the spectrum, if it is usable for high power commercial services.

44. The public interest benefits of the AWS-4 spectrum, including its economic value, will also increase significantly once it is available for terrestrial use. The largest increase in value would occur if AWS-4 operations did not need to protect any adjacent bands. But that is not the case here. For example, AWS-4 operations need to comply with technical rules designed to prevent harmful interference below 2180 MHz and above 2200 MHz. However, DISH argues that, while licensees of AWS-4 authority should also be subject to technical rules for operations below 2000 MHz, these rules should not restrict AWS-4 operations even if they limit the efficient use of the spectrum below 2000 MHz. DISH identifies certain costs associated with such technical rules, including the claimed loss of the ability to use 5 MHz of uplink spectrum. Sprint suggests that this impact can be mitigated through base station receive

filters, co-location of base stations, and LTE interference mitigations. DISH counters that filters would require 5 megahertz of transition band, co-location is not possible in all cases, and the LTE features mentioned by Sprint are more effective for UE-to-UE interference than base-to-base interference. DISH has not attempted to quantify the economic value of its possible loss of some of the use of this 5 MHz to society, but simply argues that there is no net gain in spectrum because the Commission would be trading 5 MHz of AWS-4 uplink spectrum for 5 MHz of H block downlink spectrum. This argument ignores the possibility of the Commission pairing 1995-2000 MHz with 1915-1920 MHz, as previously proposed and proposed again in the H Block NPRM, in which case making the 1995-2000 MHz band available may enable a total of 10 megahertz of spectrum by completing the pairing. Moreover, the 1915-1920 MHz and 1995-2000 MHz bands could be used by PCS operators to expand, for example, from 5 + 5 megahertz blocks to 10 + 10 megahertz blocks, or to otherwise aggregate PCS blocks. Also, as explained below, the technical rules we adopt do not prevent the use of 5 megahertz of spectrum; rather, they merely limit its use, and make provisions for improving its usability.

45. More importantly, as explained above, the amount of spectrum is not the only question that the Commission must consider as we evaluate the rules that will govern the AWS-4 band. Rather, we must evaluate how best to serve and maximize the public interest with respect to all relevant bands. Because, as explained below, companies tend to use more downlink than uplink spectrum today, it is not clear that the loss of some uplink spectrum would significantly diminish the utility (and economic value) of the paired AWS-4 spectrum. At a minimum, it appears that the public interest benefit (including economic value) of a fully usable 1995-2000 MHz band, which the Commission envisions as a downlink PCS band, is substantially greater than that of a fully usable additional 5 MHz of AWS-4 uplink—perhaps an order of magnitude greater. This may be particularly so if the 1995-2000 MHz band is ultimately paired with the 1915-1920 MHz band and the paired band is combined with other PCS spectrum to create, for example, 10+10 megahertz of PCS spectrum.

46. Further, the Spectrum Act does not preclude auctioning the 1995-2000 MHz band. We do not reach any conclusions on the specific future use of the 1995-2000 MHz band in this proceeding; such determinations are outside its scope. However, in our role as spectrum managers we do establish rules for AWS-4 that do not preclude uses of the 1995-2000 MHz band, or prejudge it to be unusable. And, although we do not make a final determination on the use of 1995-2000 MHz, we note that arguments that it may not be auctioned under the Spectrum Act have several flaws. First, many commenters on the H block proceeding have suggested that with appropriate technical limitations, the 1915-1920 MHz band will not interfere with the 1930-1995 MHz band. Thus, such interference may not present a problem, or, if it does, the problem may be partially overcome. Second, although the Commission has proposed pairing 1915-1920 MHz with 1995-2000 MHz, the Spectrum Act does not require this, and a finding that 1915-1920 MHz cannot be auctioned due to interference with 1930-1995 MHz does not, in and of itself, release us from our obligation to auction the 1995-2000 MHz band.

47. DISH has put forward a technical proposal that it feels balances the usability of the 1995-2000 MHz band with the usability of the AWS-4 uplink band, while also speeding deployment in AWS-4 by minimizing the impact of our rulemaking on the 3GPP standards body. This proposal includes DISH voluntarily designating 2000-2005 MHz as a terrestrial guard band, proposing the Commission set an emissions limit of  $60 + 10 \log_{10}(P)$  dB for AWS-4 emissions into the 1995-2000 MHz band, and asking the Commission to limit any emissions from the 1995-2000 MHz band by  $79 + 10 \log_{10}(P)$  dB above 2005 MHz. As discussed further below, we decline to adopt this proposal because we find that it will not speed deployment of the AWS-4 band or allow for full flexible use of the 1995-2000 MHz band. Moreover, DISH's request that we establish OOB limits for the 1995-2000 MHz band is not within the scope of this proceeding. Rather these limits will be addressed in our companion H Block NPRM.

48. Consequently, while the Commission has not adopted rules for the 1995-2000 MHz band, we are adopting technical rules for the AWS-4 uplink band that we predict will, in light of the record and of our assessment of the nature and characteristics of both bands, ensure efficient use of the AWS-4 band

while preserving our ability to auction licenses for operations in the 1995-2000 MHz band. Moreover, we find that the approach and the technical rules we adopt will best serve the public interest by striking an appropriate balance that will enable both the AWS-4 band and the 1995-2000 MHz band that is adjacent to the AWS-4 uplink band (2000-2020 MHz) to be used for providing flexible use services in the most efficient manner possible. In this way, we further and fully comply with our statutory mandates, including our responsibilities under the Communications Act to manage the spectrum in the public interest and Congress's specific direction regarding the 1995-2000 MHz band in the Spectrum Act. Furthermore, we recognize that in establishing rules that will enable the 1995-2000 MHz spectrum to be put to its highest and best use, we also further Congress's objectives related to the use of public safety broadband spectrum in the 700 MHz band. The Spectrum Act directs that the proceeds from the auction of licenses in the H Block, including 1995-2000 MHz, be deposited into the Public Safety Trust Fund, which will be used to fund FirstNet.

49. Therefore, as explained below, we establish carefully calibrated, limited technical restrictions on AWS-4 operations in 2000-2005 MHz, the lowest five megahertz of the AWS-4 uplink band. In particular, as explained below, we are imposing (1) increased OOB limits at and below 2000 MHz, (2) reduced power limits for mobile terrestrial operations in 2000-2005 MHz, and (3) requirements that a licensee of AWS-4 terrestrial rights or of 2 GHz MSS rights must accept harmful OOB interference, if any occurs, from future operations in the 1995-2000 MHz band into the 2000-2005 MHz portion of the AWS-4 and 2 GHz MSS uplink bands and harmful overload interference, if any occurs, from operators in the 1995-2000 MHz band into the AWS-4 and 2 GHz MSS uplink bands. We do this to protect future operations in the 1995-2000 MHz band from harmful interference; to ensure the possibility of flexible commercial use of that band, consistent with Congressional direction; and to strike a balance in ensuring the efficient use of both the AWS-4 and the 1995-2000 MHz bands. The Communications Act established "that the Commission's powers are not limited to the engineering and technical aspects of radio communications." Rather, the Communications Act directs the Commission to "encourage the

larger and more effective use of radio in the public interest” and to adopt “such rules and regulations and prescribe such restrictions and conditions . . . as may be necessary to carry out the provisions of this Act.” As explained below, we deem it necessary to set these technical limits to best maximize AWS-4 and 1995-2000 MHz spectrum for flexible terrestrial use by minimizing harmful interference between the bands. We believe that the technical rules we adopt today to protect against harmful interference will promote more effective and efficient use of the 1995-2000 MHz band and the AWS-4 band and we believe that the benefits of these rules will outweigh any restrictions on the use of a portion of the AWS-4 uplink band. Moreover, any restrictions on the use of a portion of the AWS-4 band would be more than offset by the considerable increase in flexibility that the authorization holders will receive in obtaining overall terrestrial use rights under the Commission’s part 27 flexible use rules instead of under the existing ATC rules.

50. Finally, we adopt rules that allow for the restrictions specified above to be modified by private agreement, thereby providing a licensee of AWS-4 operating authority with the ability to utilize this five megahertz of spectrum through deployment of higher performance technologies, commercial agreements with future 1995-2000 MHz band licensees, or other means. This will also provide greater flexibility to any operators that obtain licenses for both the AWS-4 A block and the 1995-2000 MHz band, as could be the case for a licensee of AWS-4 authority who bids on the 1995-2000 MHz band.

51. Discussion. For AWS-4 operations in 2000-2020 MHz, we adopt an OOB limit of  $70 + 10 \log_{10}(P)$  dB at and below 2000 MHz. This limit promotes the public interest for several reasons: (1) it promotes the best and highest use of spectrum, (2) it fulfills our statutory obligations, (3) it provides consistent levels of protection for the adjacent 1990-1995 MHz and 1995-2000 MHz downlink bands, and (4) it maintains consistency with past Commission actions.

52. Best and highest use of adjacent spectrum. DISH has stated that a required attenuation of  $70 + 10 \log_{10}(P)$  dB below 2000 MHz would have a negative impact on operations in the AWS-4 uplink band. While this is correct, we seek to balance this negative impact on a portion of the AWS-4 uplink

spectrum with the positive impact on the usability of the 1995-2000 MHz band, to obtain the most efficient use of both bands, and to maximize the overall public interest. To this end, we observe that mobile broadband uses far more downlink than uplink spectrum. For example, at an FCC forum on the future of wireless band plans, Nokia Siemens Networks presented data showing a typical LTE network producing 13 times more downlink data than uplink data, while Alcatel Lucent showed 17 to 30 times more downlink data than uplink data. Accordingly, there is a more pressing need for downlink spectrum than for uplink spectrum. Therefore, a possible limited reduction in uplink capacity may not present a hardship to a licensee of AWS-4 operating authority. In addition, as discussed further below, while some of the uplink spectrum may be restricted in power, our rules do not eliminate the use of any uplink spectrum. Furthermore, extensions of existing bands can typically be put to use more cost-effectively than new bands. Finally, to the extent some spectrum may have reduced utility to address interference issues, a fixed spectrum impact will represent a larger fraction of the 5 megahertz band from 1995 to 2000 MHz than of the lower 10 megahertz block in the 2000-2020 MHz band. Therefore, because 1995-2000 MHz can be used as a small downlink expansion of the existing PCS band, while 2000-2020 MHz is the larger uplink of a new band, these factors indicate that more efficient use of spectrum can be realized by promoting usability of 1995-2000 MHz even if it decreases the usability of a limited portion of the 2000-2020 MHz AWS-4 band.

53. Statutory obligations. We find this OOB limit, combined with the mobile power limits and requirement to accept interference within the 2000-2005 MHz band from lawful operations in the 1995-2000 MHz band, which we establish below, allows us to fulfill our spectrum manager role under the Communications Act by balancing the public interest goals of enabling efficient use of both the 1995-2000 MHz band and the AWS-4 band. Moreover, this limit enables us to fulfill our obligations under the Spectrum Act with regard to the 1995-2000 MHz band. The Spectrum Act requires the Commission, among other things, to make available via a system of competitive bidding the 1995-2000 MHz band. We believe it is consistent with Congress's specific direction to auction this spectrum to preserve our ability



to reach a possible finding that this band should support the deployment of full, robust, commercial service—including for mobile broadband. DISH suggests that we could restrict an auction of 1995-2000 MHz to small cell operations or as part of a paired air-to-ground / ground-to-air band. We decline to so limit the potential uses of the 1995-2000 MHz band at this time, because this would likely diminish the efficiency and usefulness of the spectrum given the significant value we believe exists for high power uses in the 1995-2000 MHz band. Further, the Spectrum Act specifically calls for flexible use of 1995-2000 MHz, and limiting the band to be suitable only for small cell or air-to-ground services may improperly curtail such flexible use if full terrestrial use remains a reasonable possibility for the band. While flexible use rules that permit higher power terrestrial use could also permit small cell or air-to-ground services, the reverse is not true—a band limited to either of those uses could not also be used for full power terrestrial operations. DISH fails to explain how we can fulfill our statutory obligation to make the 1995-2000 MHz band available for flexible use via a system of competitive bidding without a strong OOB limit. Moreover, it is not clear if either small cell or air-to-ground use would result in an improved interference environment as compared to full power use. Should the Commission ultimately determine, in the forthcoming proceeding on this band, to limit the permissible services in this band, DISH or any other party is free to petition us to revisit the technical rules we adopt herein.

54. Consistent Protection Levels. To promote more effective and efficient use of the 1995-2000 MHz band, we believe the same OOB limit the Commission adopted to protect current PCS operations below 1995 MHz— $70 + 10 \log_{10}(P)$  dB—will be both necessary and sufficient to protect future operations in the 1995-2000 MHz band. This creates consistency in our rules, by affording the 1995-2000 MHz band the same protections as the existing PCS band.

55. Past Commission Actions. The Commission has long sought to put the 1995-2000 MHz band to productive commercial use. In 2004, 2007, and 2008, the Commission undertook efforts to make this spectrum available for full flexible use. We therefore reject the approach advocated by some that the 1995-2000 MHz band should be used as a guard band between the extended PCS downlink band from

1990-1995 MHz and the AWS-4 uplink band. Setting aside this block for no use is directly at odds with the Commission's past actions. Further, in 2010, the National Broadband Plan recommended that the Commission make this band available through auction. Thus, the public has long been on notice that the 1995-2000 MHz band is not intended for use as a guard band. Such notice significantly predates the current MSS licensee's acquisition of DBSD and TerreStar in 2011.

56. The Record. The proposed OOB limit of  $70 + 10 \log_{10}(P)$  dB at and below 2000 MHz received some support in the record. For example, Sprint supports this OOB level as necessary to protect the 1995-2000 MHz band. U.S. Cellular proposed a limit of  $70 + 10 \log_{10}(P)$  dB at and below 2000 MHz to protect the 1995-2000 MHz band. Several other commenters indirectly support an OOB limit of  $70 + 10 \log_{10}(P)$  at 2000 MHz, which will be five megahertz away from full power use of the AWS-4 uplink band, by stating that this level is necessary to protect PCS operations below 1995 MHz without assuming any reduction in power between 2000-2005 MHz. To achieve this level of protection for the 1995-2000 MHz band without applying this OOB limit at 2000 MHz and lower power limits in 2000-2005 MHz, we would need to create frequency separation between the 1995-2000 MHz band and the AWS-4 uplink band. For the reasons explained above, however, we decline to shift the AWS-4 uplink band up 5 megahertz (or more) to 2005-2025 MHz. DISH makes several arguments objecting to this OOB limit as unprecedented, unnecessary, and restrictive. DISH also asserts that this limit would affect AWS-4 operations, including negative impacts for AWS-4 devices, rendering 25% of the AWS-4 uplink unusable, slowing DISH's deployment due to delays in the 3GPP standards process, requiring as many as 15-30% additional sites for licensees of AWS-4 authority, and not creating a net gain of spectrum for broadband. DISH proposed that we instead adopt an OOB limit of  $43 + 10 \log_{10}(P)$  dB at 2000 MHz and separately that we adopt an OOB limit of  $60 + 10 \log_{10}(P)$  dB at 2000 MHz. We are not persuaded by these arguments.

57. We adopt the specific level of  $70 + 10 \log_{10}(P)$  dB because it provides a reasonable level of protection for the 1995-2000 MHz band, there is directly applicable precedent in the existing protection

of the PCS G block from MSS/ATC, and it is superior to other attenuation levels raised in the record. As DISH correctly notes, the interference from the AWS-4 uplink to operations in the 1995-2000 MHz band is likely to be mobile-to-mobile interference, and is therefore probabilistic, meaning the probability of interference depends on the likelihood of the interfering and victim mobiles passing close enough to each other under the right conditions. However, determining that interference is probabilistic does not mean that it should be ignored; rather, it means that rules should be set to ensure that the probability of interference is reasonably low. To evaluate this probability, we make reasonable assumptions about interference and look at the separation needed between mobile devices to prevent interference with those assumptions. A larger resulting separation indicates a higher likelihood of interference. In its comments on this proceeding, Motorola proposes assumptions for the protection of the 1930-1995 MHz band that we find reasonable, with one modification, and applicable to the 1995-2000 MHz band. Using the proposed assumptions with this modification,  $70 + 10 \log_{10}(P)$  dB yields a separation of 1.4 meters (under 5 feet), similar to the separation of 2 meters (about 6 feet) proposed by Motorola and the separations typically used in 3GPP standards.  $70 + 10 \log_{10}(P)$  dB is also the level that Sprint recommends as necessary to protect the 1995-2000 MHz band. As another reference point, 3GPP adopts a similar but more stringent level of  $80 + 10 \log_{10}(P)$  dB for the protection of mobile receivers from mobile transmitters in most cases.

58. DISH's initial proposal of  $43 + 10 \log_{10}(P)$  dB does not provide adequate protection to the 1995-2000 MHz band. Applying the same calculations to the level of  $43 + 10 \log_{10}(P)$  dB yields a separation of 32 meters (over 100 feet). This represents a dramatic increase in the probability in interference, because it is far more likely that two mobiles will pass within 100 feet of each other, rather than 5 feet of each other.

59. Although DISH provides more technical support for its later proposal of  $60 + 10 \log_{10}(P)$  dB, including references to two 3GPP submissions, from Qualcomm and Intel respectively, and one CEPT (European Conference of Postal and Telecommunications Administrations) study that proposed

levels less stringent than  $60 + 10 \log_{10}(P)$  dB in various situations, we observe that applying the above assumptions to the  $60 + 10 \log_{10}(P)$  dB level would result in a separation of 14 meters (about 46 feet), an unacceptably high separation compared to industry norms. In addition, each of these studies considers a different case than we consider here, and thus is not directly applicable. Finally, we note that despite these studies, 3GPP has adopted the level of  $80 + 10 \log_{10}(P)$  dB for the protection of the vast majority of bands, and offering a level of only  $60 + 10 \log_{10}(P)$  dB may not allow full use of the 1995-2000 MHz band. Further, DISH argues that independent of the OOB level, interference can only occur 0.25% of the time. However, DISH offered no data to support its conclusions. In sum, contrary to DISH's assertions that this emission limit is not necessary to protect the 1995-2000 MHz band, we find attenuating OOB in 1995-2000 MHz by a factor of  $70 + 10 \log_{10}(P)$  dB will provide needed protection to the 1995-2000 MHz band.

60. In addition to providing reasonable protection from interference,  $70 + 10 \log_{10}(P)$  dB is the level the Commission has already determined appropriate for protection of PCS operations below 1995 MHz, and given the expected similarity of operations in the 1995-2000 MHz band, this level is also applicable to AWS-4 emissions into the 1995-2000 MHz band. DISH suggests that this is not an applicable precedent because it was previously applied at 5 megahertz separation from the MSS/ATC band, not at the band edge. DISH suggests that precedents such as  $60 + 10 \log_{10}(P)$  dB,  $55 + 10 \log_{10}(P)$  dB, or  $43 + 10 \log_{10}(P)$  dB are more relevant. We disagree with DISH because we find that the interference in the 1995-2000 MHz band will be driven by the AWS-4 OOB into the 1995-2000 MHz band itself, not by the emission levels of the transmissions outside these frequencies. Therefore, the frequency separation from the band edge is not determinative of establishing the OOB limit. In addition, the  $60 + 10 \log_{10}(P)$  dB level is from a study of TDD to FDD interference released by the Commission's Office of Engineering and Technology (OET), which did not result in the adoption of this limit into our rules. Although this study considers a similar case of mobile-to-mobile interference, the difference results from differing assumptions, including assumptions that the victim handset is using

UMTS and can tolerate an interfering signal 11.8 dB stronger than its desired signal. LTE mobiles, however, cannot necessarily tolerate such high levels of interference, and we find, in agreement with the modified Motorola assumptions discussed above, that the interfering signal should be no stronger than the mobile's noise floor. Applying this one change to the assumptions of the OET study would result in level of at least  $71 + 10 \log_{10}(P)$  dB. DISH also argues that the  $55 + 10 \log_{10}(P)$  level, used in BRS, is a similar case of TDD to FDD interference. There are many differences between the BRS band and the 1995-2000 MHz band, including the flexibility of BRS operators to synchronize their systems to avoid interference and the greater ease of achieving frequency separations in a 194 megahertz band. In addition, we note that the BRS rules apply a level of  $67 + 10 \log_{10}(P)$  to fixed stations in the event of interference complaints, much closer to the  $70 + 10 \log_{10}(P)$  level we adopt here. Further, as discussed above, the  $43 + 10 \log_{10}(P)$  dB level does not provide adequate protection from interference in this case and so is not appropriate here.

61. Although applying this limit of  $70 + 10 \log_{10}(P)$  dB at the edge of the AWS-4 band may be more restrictive than applying it at 1995 MHz and below, we find DISH's assertions that adopting this limit at and below 2000 MHz would increase the cost of mobile devices, require significant power reductions, and require a roll-off region to be poorly supported and unpersuasive. DISH did not quantify these hardships with specific cost numbers, filter insertion losses, power reduction requirements, or the amount of spectrum impacted. Nor did DISH explain what factors would increase the cost of the mobile devices, so it is not clear if these impacts would be independent of or additive to one another. For example, there is a trade-off between filter roll-off and filter cost (and therefore device cost), so it may not be reasonable to assert both hardships will result. Further, we note that to the extent there is a roll-off region or power reduction region, these reduce the power in the lower part of the AWS-4 uplink band, but do not necessarily render it unusable. For example, if there is reduced coverage in the first 5 megahertz, it may still be usable for capacity in areas of good coverage. In fact, with technological advancements it may be put to use dynamically. For example, a base station scheduler using a 10 megahertz carrier in

2000-2010 MHz could assign mobiles in good signal conditions (and therefore requiring less power to close the link) to the lower 5 megahertz, and mobiles in poor signal conditions (requiring higher power) to the upper 5 megahertz, thereby making use of all of the spectrum.

62. Similarly, we find to be flawed DISH's arguments that the limit of  $70 + 10 \log_{10}(P)$  dB at and below 2000 MHz would render 25% of the AWS-4 uplink spectrum unusable and increase AWS-4 deployment costs by 15-30%. DISH's argument for rendering 25% of the uplink unusable actually asserts that base station operations in the 1995-2000 MHz band would potentially overload its AWS-4 base station receivers; DISH does not make an argument based on the AWS-4 uplink OOB limit. Therefore, this argument is not relevant to the OOB limits on AWS-4 devices. However, we do discuss potential interference from the 1995-2000 MHz band to AWS-4 base stations below. Similarly, DISH argues that the anticipated OOB from 1995-2000 MHz band transmitters above 2005 MHz will require additional site builds where collocation is not possible, and makes some high-level, general statements that the impact represents about a 15% increase in the number of sites to be built. This is also not relevant to the limit of  $70 + 10 \log_{10}(P)$  dB at 2000 MHz for the AWS-4 uplink. The technical requirements for base stations in the 1995-2000 MHz band are outside the scope of this Report and Order and will be addressed in the H Block NPRM.

63. We also find for the reasons stated above that, to the extent imposing a limit of  $70 + 10 \log_{10}(P)$  dB at and below 2000 MHz does have some negative impact on the usability of the AWS-4 uplink, this impact is balanced by the increased utility of the 1995-2000 MHz band. DISH argues that its claimed loss of 25% of its uplink spectrum to enable the full flexible use of the 5 megahertz of the 1995-2000 MHz band will result in no net increase in the amount of spectrum available for broadband. However, this claim overlooks the fact that if 1995-2000 MHz is paired with 1915-1920 MHz, the calibrated restrictions we place on AWS-4 may enable the Commission to make available 10 megahertz of broadband spectrum. Moreover, the restrictions would still allow the full use of at least 5 megahertz (if not more) of uplink (i.e., at least 2005-2010 MHz of the 2000-2010 MHz uplink segment) and the full 10

megahertz of paired downlink spectrum (i.e., 2180-2190 MHz). This would not be the case if the restrictions at issue were imposed on 1995-2000 MHz in a scenario where that spectrum is only paired with another 5 megahertz. And, even if 1995-2000 MHz becomes an unpaired downlink band, DISH's argument rests on the assumption that 5 megahertz of uplink in the 2000-2020 MHz band is equivalent to 5 megahertz of downlink in the 1995-2000 MHz. As discussed above, this argument is flawed, because (1) there is more need for downlink spectrum than uplink spectrum, (2) the restricted use of 5 megahertz would have less of an impact to a 10 or 20 megahertz carrier in the AWS-4 band than it would to a 5 megahertz carrier in the 1995-2000 MHz band, including a carrier that would use the 1995-2000 MHz band to expand an existing use of the PCS band, (3) given the downlink-limited nature of broadband capacity, the loss of 5 megahertz of uplink spectrum in a band with two paired 10 + 10 megahertz blocks may have no impact on actual network capacity, and (4) an extension of an existing band is more easily utilized than a new band.

64. We are also not convinced by DISH's argument that adopting this limit will protect and favor an unassigned band over an assigned band. Because there has been no deployment of terrestrial services, devices, or base stations in either band, we find this argument unpersuasive. DISH further argues that adopting this limit places "the entire burden" on AWS-4, and that imposing this limit is premature and an attempt to predetermine the rules for the 1995-2000 MHz band. We disagree. We do not set rules for 1995-2000 MHz in this proceeding; rather, we set some limitations on AWS-4 which are balanced by promoting the usability of the 1995-2000 MHz band.

65. In addition, the likely practical impact of technical protections for the 1995-2000 MHz band in the AWS-4 uplink is small. We are not reclaiming any spectrum; rather, we are implementing an OOB limit that may reduce the power levels on some uplink spectrum. As discussed above, with newer technologies such as LTE, power reductions of a portion of a carrier do not prevent it from being put to use in some portions of a cell and augmenting capacity. Further, current broadband networks use far more downlink capacity than uplink capacity. Based on prevailing traffic patterns, a licensee of AWS-4

authority with 20 MHz of downlink capacity is very likely to have excess uplink capacity in any case. DISH states that this line of reasoning is “misguided”, because DISH needs 40 megahertz to compete, and needs “more spectrum, not less.” However, DISH fails to address the asymmetry of traffic, and only makes the blanket statement that it needs more spectrum. Of course, like all operators, DISH is free to acquire more spectrum as needed, and in fact we observe that DISH has spectrum in other bands, including in the 700 MHz Band. In any case, we are creating 40 megahertz of terrestrial rights. Although the rules we adopt may limit the power levels in part of the uplink spectrum, they do not prohibit its use, and as discussed below, they leave room for the licensee of AWS-4 operating authority to find technical or business approaches to increase the utility of the uplink spectrum if needed.

66. Finally, we find DISH’s arguments that adopting this emission limit would delay its deployment time frame by causing delay in equipment standards in 3GPP to be unpersuasive. First, the Commission has historically not based its decisions regarding the appropriate technical rules for a wireless service merely on the potential of those decisions to delay the development of private party technical standards. Second, DISH is not required to await 3GPP standards resolution to design, test, and deploy equipment, particularly if it is the only operator in the band. Rather, a decision to wait until 3GPP has established final standards is an internal business decision, not a delay imposed by the Commission’s development of technical rules for the service. Third, the only change necessary in the 3GPP standard would be modifying band 23 to accommodate the emission limit at 2000 MHz (and the power limits for operations in 2000-2005 MHz); many of the other parameters for this band (e.g., OOB at 2020 MHz; duplex spacing; frequencies; channel numbers; and so forth) could remain the same. Sprint has indicated that this additional work should take less than 6 months, and it has stated its commitment to facilitating relevant work in 3GPP. Fourth, DISH can also mitigate a delay in obtaining final standards in several ways. For example, in its comments, DISH identifies several groups of tasks that would need to be completed prior to the launch of service, but states that the task groups must be performed serially, taking four years in sum. We do not believe that either engineering or business practices require these tasks be



completed in a serial process; rather, we believe that they can be accomplished in part in parallel. Indeed, in the WCS proceeding, AT&T indicated that about half of the time needed to develop standards would overlap with equipment design and equipment testing. If DISH were to apply a similar level of overlap to the tasks it outlines, it would still be able to meet its proposed 4 year timeline for launching service. In sum, while DISH makes unsupported, speculative, and vague statements as to the possible impact of 3GPP timing on its market entry, the impact of not adopting these rules is clear and detrimental to the public interest.

67. As discussed above, DISH also proposed a combination of rules and commitments that it says will allow full use of the 1995-2000 MHz band while preventing any 3GPP delay. In addition to finding above that this proposal does not facilitate full flexible use of the 1995-2000 MHz band, we also find that it does not reduce the likelihood of 3GPP delays. DISH bases its argument on its assertion that integration of an external duplexer will allow it to meet a level of  $60 + 10 \log_{10}(P)$  dB without changing the design of its chipset. However, as DISH has pointed out, the 3GPP standards contain the current ATC rule for OOB in 1995-2000 MHz in the device co-existence table, and regardless as to whether the limit is  $60 + 10 \log_{10}(P)$  dB or  $70 + 10 \log_{10}(P)$  dB, 3GPP may choose to update this table and evaluate the impact of the new level on device design. Further, since the level of  $60 + 10 \log_{10}(P)$  dB affords less protection than  $70 + 10 \log_{10}(P)$  dB, it may create more contention and delay in 3GPP than our proposal. In summary, we do not find support in the record that adopting a level of  $60 + 10 \log_{10}(P)$  dB will bring operations in the AWS-4 band to market sooner than the attenuation of  $70 + 10 \log_{10}(P)$  dB that we do adopt.

68. Private Agreements. We recognize that technological improvements in devices in the 1995-2000 MHz band, as well as willingness on the part of licensees of the 1995-2000 MHz band to accept a higher probability of interference, could reduce the need for OOB restrictions in 1995-2000 MHz. Therefore, we allow for licensees of AWS-4 authority to enter into private operator-to-operator

agreements with all 1995-2000 MHz licensees to operate in 1995-2000 MHz at OOB levels above  $70 + 10 \log_{10}(P)$  dB.

69. Summary. We find that while DISH argues that the imposition of an OOB limit of  $70 + 10 \log_{10}(P)$  dB on AWS-4 uplink operations will render 5 megahertz of the AWS-4 uplink unusable and create delays in 3GPP, these arguments are unsupported, speculative, and vague, and in some cases not relevant to the uplink OOB limit. Similarly, we do not find DISH's recent proposal of  $60 + 10 \log_{10}(P)$  dB at 2000 MHz to be an appropriate limit. While we acknowledge that imposition of the limit of  $70 + 10 \log_{10}(P)$  dB may have a negative impact on the usability of a portion of the AWS-4 uplink band, this is more than offset by the public interest benefits of increasing the usability of the 1995-2000 MHz band. Moreover, some of DISH's objections are not relevant to the OOB limit on the AWS-4 uplink, but instead have to do with power and OOB for operations in the 1995-2000 MHz band. As discussed below, DISH in fact does also suggest OOB and power limitations for the 1995-2000 MHz band. As discussed elsewhere, we have had an open proceeding since 2004 that proposed full power use in 1995-2000 MHz, and an OOB limit of  $43 + 10 \log_{10}(P)$  dB for H block transmitters. Therefore, DISH has been aware of these issues for some time. These issues, moreover, can be addressed in the H Block NPRM. Further, even if our actions do in fact create only 15 megahertz of usable uplink for terrestrial use, this Report and Order still creates a large increase in the overall utility of this spectrum. That is, 15 megahertz of full usable terrestrial uplink can be put to more productive use than 20 megahertz of MSS/ATC uplink spectrum. For example, one commenter suggested that this conversion creates billions of dollars in value. For all these reasons, we find that requiring an attenuation of  $70 + 10 \log_{10}(P)$  dB at and below 2000 MHz is appropriate for the AWS-4 uplink.

70. Finally, we decline to address the request by DISH that we clarify that the existing linear interpolation of the OOB between 2000 MHz and 1995 MHz should be calculated in watts, rather than in dB. Because we adopt a flat OOB limit across 1995-2000 MHz, this issue is moot, and we do not make a determination on it.

71. Measurement Procedure. We adopt the measurement procedure set forth in Section 27.53(h) of our rules to determine compliance with this limit. This section requires a measurement bandwidth of 1 megahertz or greater with an exception allowing a smaller measurement bandwidth in the first megahertz adjacent to the channel.

72. In sum, in order to maximize the public interest, comply with Congressional direction, and best balance the most efficient use of all relevant spectrum bands, including enabling future operations in the 1995-2000 MHz band and creating a useful AWS-4 band, we set the OOB limit of  $70 + 10 \log_{10}(P)$  dB at all frequencies at or below 2000 MHz.

**(iii) Interference with operations in 2020-2025 MHz**

73. We conclude that the  $43 + 10 \log_{10}(P)$  dB OOB limit and the measurement procedure set forth in § 27.53(h) are appropriate for protecting the 2020-2025 MHz band. No commenters opposed this proposal. Thus, for the reasons articulated in the AWS-4 NPRM, 77 FR 22720, Apr. 17, 2012, and in the ICO Waiver Order, 74 FR 29607 (Jun. 23, 2009), we find that this OOB limit remains appropriate.

**(iv) Interference with operations above 2025 MHz**

74. We conclude the  $43 + 10 \log_{10}(P)$  dB OOB limit and the associated measurement procedure defined in § 27.53(h) are appropriate for protecting federal operations and BAS and CARS operations at 2025-2110 MHz. This limit is consistent with the record and no commenters disagreed with a  $43 + 10 \log_{10}(P)$  OOB limit above 2025 MHz, thus we conclude the record indicates that the benefits of the proposal outweigh any potential costs. Thus, we find it appropriate to continue to apply the  $43 + 10 \log_{10}(P)$  OOB limit and its associated measurement procedure that has effectively been in place since 2009.

**(v) Interference with operations below 2180 MHz**

75. We adopt an OOB limit of  $43 + 10 \log_{10}(P)$  dB to protect wireless systems that will operate below 2180 MHz. This conclusion is supported by the record. Furthermore, we anticipate future operations in the 2155-2180 MHz band will be similar in design and use to cellular and PCS systems, in which the  $43 + 10 \log_{10}(P)$  dB limit has been used effectively in limiting adjacent channel interference between systems operating in the same direction (e.g., downlink next to downlink). We therefore adopt the  $43 + 10 \log_{10}(P)$  dB OOB limit below 2180 MHz for all transmitters operating in the 2180-2200 bands. With no commenters opposing this emission limit, we further conclude that its benefits outweigh any potential costs.

**(vi) Interference with operations above 2200 MHz**

76. Background. In the AWS-4 NPRM, the Commission sought comment on the appropriate OOB limit for licensees of AWS-4 downlink spectrum at 2180-2200 MHz in order to protect adjacent block operations, including federal operations at 2200-2290 MHz. The Commission observed that the part 25 rules set forth strict emission limitations (-100.6 dBW/4 kHz EIRP) in the 2180-2200 MHz band, including at the 2200 MHz band edge. The rules also prohibit the location of 2180-2200 MHz base stations within 820 meters of a Federal earth station operating in the 2200-2290 MHz band. In 2009, however, the Commission waived the part 25 emission limit (-100.6 dBW/4kHz EIRP) rule for one of the 2 GHz MSS/ATC licensees with regard to operations at or above 2200 MHz; instead of the rule, that licensee was required to satisfy the terms of an operator-to-operator agreement between the MSS/ATC licensee and certain federal operators in the 2200-2290 MHz band. That agreement specified that, in certain circumstances, the MSS/ATC licensee was required to satisfy the part 25 emission limit, but in other circumstances, only had to satisfy the standard Commission emission limit of  $43 + 10 \log_{10}(P)$  dB. In December 2012, DISH and federal users of the 2200-2290 MHz band entered into an operator-to-operator agreement, which the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce transmitted to the Commission. The agreement specifies that DISH (through its subsidiaries, as appropriate) will operate each base station in the 2180-2200 MHz band such that the

power spectral density (PSD) of the signal received at existing Federal earth stations and aeronautical mobile telemetry (AMT) stations shall not exceed agreed upon levels. The agreement also contains provisions for addressing the operation of 2180-2200 MHz base station relative to new federal stations to be deployed in the 2200-2290 MHz band.

77. Discussion. We adopt the following approach for protecting Federal operations in the 2200-2290 MHz band from harmful interference from AWS-4 operations in the 2180-2200 MHz band. First, as discussed further below, we permit AWS-4 operators and Federal operators to enter into an operator-to-operator agreement that will specify terms of the permissible AWS-4 OOB limits and/or maximum actual AWS-4 emissions to be received at the sites of Federal operations in the 2200-2290 MHz band. Second, we establish default OOB limits for AWS-4 operations into the 2200-2290 MHz band in the event such private agreement were not in effect (e.g., the agreement was terminated pursuant to its terms); AWS-4 licenses return to the Commission (e.g., for a licensee's failure to meet the construction requirements).

78. We adopt this approach after careful analysis of the options before us. As explained above, the current ATC regime for protecting Federal operations in the 2200-2290 MHz band is a mix of Commission rules, waiver orders, and operator-to-operator agreements. As a result, the two MSS/ATC licensees have different interference protection requirements with respect to Federal operators in the 2200-2290 MHz band. Further, as noted above, during the course of this proceeding, the current 2 GHz MSS/ATC licensees (and prospective AWS-4 licensees) entered into an operator-to-operator agreement with Federal operators in the 2200-2290 MHz band. It is against this backdrop that we promulgate OOB rules for AWS-4 base station emissions into the 2200-2290 MHz band, which, like the ATC regime, will both set clear rules and allow licensees of AWS-4 operating authority to deviate from those rules by entering into operator-to-operator agreements, which will be transmitted to the Commission by NTIA.

79. First, we permit, but do not require, licensees of AWS-4 authority to enter into operator-to-operator agreements with Federal operators at 2200-2290 MHz to address the attenuation of emissions from AWS-4 base stations operating at 2180-2200 MHz into the adjacent Federal band, so long as such agreements do not otherwise run afoul of other Commission rules. We observe that the existing MSS/ATC licensees and federal users of the 2200-2290 MHz band have already effectuated such an agreement on what they, as actual operators, find to be the best environment to avoid actual harmful interference. We applaud the adjacent Federal and non-Federal operators for reaching this agreement and, with this Report and Order, provide a foundation for this agreement and other similar agreements that might be reached in the future without the need for a waiver or other special permission from the Commission. Therefore, we permit the DISH-Federal Agreement to govern AWS-4 base station emissions from 2180-2200 MHz into the 2200-2290 MHz band. Specifically, when, as discussed below, the licenses held by the current 2 GHz MSS licensees are modified to include AWS-4 service, we will include as conditions to such license modifications the requirement that the licensees of AWS-4 operating authority must comply with the DISH-Federal Agreement with regard to the permissible AWS-4 emissions into the 2200-2290 MHz band and/or the maximum actual AWS-4 emissions to be received at the specified sites of Federal operations in the 2200-2290 MHz band. To ensure that this agreement, and any subsequent agreements are consistent with other Commission rules and do not impede the operation of secondary markets, we require that the licensee of AWS-4 authority who is a party to an operator-to-operator agreement maintain a copy of the agreement(s) in its station files and disclose it, upon request, to prospective AWS-4 assignees, transferees, or spectrum lessees, to Federal operators in the 2200-2290 MHz band, and to the Commission.

80. Second, to ensure that OOB limits are established in the event such private agreements are not entered into or do not address all situations between AWS-4 operations in the 2180-2200 MHz band and Federal operations in the 2200-2290 MHz band, we establish default OOB limits for AWS-4 emissions into the 2200-2290 MHz band. Because the record does not contain any technical justification

to support any specific OOB limit, and because the Commission did not propose a specific limit in the AWS-4 NPRM, we adopt the protection levels contained in the ATC rules relative to protection of Federal operations in the 2200-2290 MHz band. Accordingly, AWS-4 base stations operating in 2180-2200 MHz shall not exceed an EIRP of -100.6 dBW/4 kHz for emissions into the 2200-2290 MHz band. Further AWS-4 base stations operating in 2180-2200 MHz may not be located less than 820 meters from a U.S. Earth Station facility operating in the 2200-2290 MHz band.

81. Finally, to avoid possible confusion between the operation of an operator-to-operator agreement and the default OOB limit, we clarify the application of our rules in the event that (1) an operator-to-operator agreement ceases to operate (for whatever reason) or (2) is operative for less than the entire universe of AWS-4 licenses or Federal operations in the 2200-2290 MHz band. In either case where the agreement is not in effect, the licensee of AWS-4 operating authority must comply with the default rule. For example, should the DISH-Federal Agreement terminate for any reason, DISH (assuming it is the licensee of AWS-4 authority) would be required to operate pursuant to the default rule.

82. To ensure that AWS-4 base stations would be able to operate pursuant both to an operator-to-operator agreement and to the default rule, equipment manufacturers may seek equipment authorization for equipment designed against either the OOB limit in the default rule, the OOB limit in an executed operator-to-operator agreement between a licensee of AWS-4 authority and Federal operators in the 2200-2290 MHz band (which must provide at least  $43 + 10 \log_{10}(P)$  dB of attenuation), or both, except as specified below. We shall approve or deny the equipment authorization, based on testing against whichever (or both) OOB the manufacturer requests.

83. We recognize, however, that equipment designed to operate to the stricter default OOB limits will also comply with any more relaxed OOB limit contained in an operator-to-operator agreement. In the case where equipment is intended to be operated at either the default or the relaxed limits, we believe the equipment will be either modified or adjusted by the manufacturer or in the field. That is, we expect the equipment to have more than one mode of operation in this case. We require the

application for equipment authorization for such equipment to clearly demonstrate compliance with both limits. If at the time of authorization the equipment is only approved for compliance with one limit, but is expected to be modified subsequently by the manufacturer to operate in another mode either in the factory or in the field, the original equipment must be approved to permit such changes or meet such changes as allowed in the permissive change rules for equipment authorization.

84. In addition, a licensee in the AWS-4 band may operate its base stations consistent with its operator-to-operator agreement only if such an agreement is in effect. In any other situation, including where such an agreement existed, but has been terminated (for whatever reason), the licensee must operate AWS-4 base stations that have obtained equipment authorization based on the default rule. To the extent that a licensee of AWS-4 authority that is a party to an operator-to-operator agreement installs and operates bases stations that are authorized against an OOB limit that is less stringent than the default rule, that licensee is solely responsible for ensuring that its equipment would be authorized to operate in the event that the agreement terminates (for whatever reason).

**(vii) Interference with Global Positioning Systems (GPS) operations**

85. Background. In the AWS-4 NPRM, the Commission observed that the current Part 25 MSS/ATC rules require certain protection limits over the GPS band at 1559-1610 MHz. Specifically, the current rules require 2 GHz MSS/ATC base stations and mobile terminals to provide an EIRP limit of -70 dBW/MHz or -80 dBW/700Hz, measured over any two millisecond active transmission interval, in the 1559-1610 MHz band. The Commission also observed that different MSS/ATC bands have different frequency separations from the GPS band and sought comment on whether any special interference rules should apply to AWS-4 operations to protect GPS service.

86. Some parties submitted comments asking for tighter emissions limits over the GPS band. USGIC argued that the current part 25 OOB limits for the protection of GPS operations at 1559-1610 MHz from terrestrial operations in the 2 GHz band are obsolete and proposed that the Commission adopt



the EIRP emission limits agreed to by TerreStar and DBSD in their ATC authorization proceedings— EIRP emission limits for mobile transmitters of -95dBW/MHz for wideband signals and of -105dBW/kHz for narrowband signals, and EIRP emission limits for fixed or base station of -100dBW/MHz for wideband signals and of -110dBW/kHz for narrowband signals. Deere similarly asserted that the OOB limits in the Part 25 rules are not sufficient to protect GPS operations at 1559-1610 MHz, observed that TerreStar and DBSD had agreed to more stringent limits, and recommended that the Commission “further study this issue and consider an update to the OOB limit” that should be applied to AWS-4 operations. On September 27, 2012, DISH and USGIC submitted a letter agreement in which DISH agreed to limit its OOB EIRP densities over the 1559-1610 MHz band to the limits contained in USGIC’s comments.

87. Other parties opposed the addition of GPS specific protection limits for AWS-4 operations. CTIA stated that GPS protection limits are not necessary for AWS-4 operations because the AWS-4 band is located several hundred megahertz away from the GPS band. CTIA further observed that operations in bands much closer to the GPS frequencies, such as the AWS-1 band (1710-1755 MHz; 2110-2155 MHz), operate with an OOB limit of  $43 + 10 \log_{10}(P)$  dB into the GPS band and these operations have not given rise to any complaints of interference to GPS. Instead of adopting OOB limits, either by rule or by license condition, CTIA recommended that the Commission continue its recent efforts to examine receiver performance and noted that the Commission had recently held a workshop on receiver performance issues. LightSquared also stated that the Commission should focus its efforts to protect GPS by examining GPS receiver reliability standards. Greenwood claimed that the -105dBW/MHz EIRP limit would be reasonable if implemented over time, provided that receiver protection requirements for GPS/GNSS receivers increase to mitigate interference susceptibility. Greenwood, like CTIA, also observed that there are many millions of devices transmitting between the GPS and AWS-4 bands that operate in bands that do not have specific OOB protection levels for GPS and that are not causing OOB interference to GPS.

88. Discussion. The Commission has long recognized the importance of GPS and our responsibility to ensure that it receives appropriate interference protections from other radiocommunication services. The Commission generally supports the actions of licensees to resolve interference issues raised by other spectrum holders or users through private agreements, where, as is the case here, they are not otherwise inconsistent with Commission rules or policies. Because the prospective licensees of AWS-4 operating authority have reached a private agreement with the industry council representing GPS interests, the USGIC, we believe the most appropriate approach is to require that, as a license condition, the licensees comply with this agreement and the specific GPS protection limits contained therein. This is consistent with the USGIC's request that we "condition AWS-4 licenses with the OOB limits jointly agreed by DISH and the USGIC." The licenses, moreover, shall remain subject to this license condition in the event that the licensees assign or otherwise transfer the licenses to successors-in-interest or assignees. To the extent that AWS-4 licenses return to the Commission (e.g., for a licensee's failure to meet the construction requirements), the Commission will, prior to reassigning such licenses, consult with NTIA about the need for specific OOB requirements on the new licenses to protect GPS operations in the 1559-1610 MHz band.

89. In requiring the licensees comply with their voluntary agreement, we need not—and do not—reach the issue of determining whether the record contains sufficient information on whether and, if so, at what level, to establish an OOB limit rule for protection of GPS from AWS-4 operations. We observe that the USGIC stated that both it and its member Deere believe that the emissions limits for the GPS band for services operating in other frequency bands should be considered on a "case-by-case basis." We make no determination as to whether the limits in the private agreement are appropriate or viable for services operating in other spectrum.

#### **(viii) Interference with Other Bands**

90. DISH suggested that we should impose emission limits on the 1995-2000 MHz block and on the 1930-1995 MHz PCS blocks, as well as power limitations for 1995-2000 MHz operations.

Establishing such limits are outside the scope of this Report and Order, which sets service rules for AWS-4 spectrum, not the 1995-2000 MHz or 1930-1995 MHz bands. OOB and power limits for the 1995-2000 MHz band will be addressed in the H Block NPRM. To the extent that any party seeks a change in the existing PCS rules, that party is free to petition the Commission for a rule change.

91. Nevertheless, we observe that DISH proposed that the Commission limit 1995-2000 MHz block base station operations by an attenuation of  $70 + 10 \log_{10}(P)$  dB at and above 2000 MHz, and later proposed instead that such operations should be attenuated by a factor of  $79 + 10 \log_{10}(P)$  dB at and above 2005 MHz. Similarly, DISH suggested that the in-band transmit power of operations in the 1995-2000 MHz band should be significantly reduced, i.e., that this should be a low power band. These proposals could reduce the usability of the 1995-2000 MHz band. Such limits appear to be inconsistent with our general finding that the public interest, consistent with the Spectrum Act, is best served by preserving the usability of 1995-2000 MHz even if there is a possibility of reduced usability of the lower portion of the AWS-4 uplink band. Thus, we caution any licensee of AWS-4 operating authority against designing or deploying its network (except at its own risk) assuming either of these levels of OOB protection for the 2000-2005 MHz band from the 1995-2000 MHz band or low power limits in the 1995-2000 MHz band. As noted below, the Commission will not take action to protect licensees of AWS-4 operating authority from interference that arises in such a scenario. We expect that licensees and their equipment suppliers will take this warning into account when establishing technical specifications, including industry standards, and procuring equipment for the band. To the extent that satellite receivers have already been deployed, which could suffer reductions in performance if full power services are deployed in 1995-2000 MHz, we note that our proceeding proposing full power flexible use for 1995-2000 MHz has been open since 2004, before satellites operating in the 2000-2020 MHz band were launched, or even likely designed. Therefore, we expect that the satellites were designed with this overload scenario in mind and there should, therefore, be no impact to MSS. To the extent this is not the case, we do not expect to limit

use of 1995-2000 MHz due to any limitations of receivers deployed after our proceeding on use of 1995-2000 MHz was opened.

## **2. Co-Channel Interference Among AWS-4 Systems**

92. Co-channel interference rules prevent harmful interference between geographically adjacent licenses operating in the same spectrum. Specifically, to avoid this interference, the Commission adopts field strength limits that apply at the geographic edge of the license area. In the AWS-4 NPRM, the Commission proposed that the current AWS-1 signal strength limit be applied to AWS-4 operations. we must adopt signal strength limits here. With no commenters opposing this proposal, we conclude that the benefits of our proposal outweigh any potential costs. As we are basing our technical rules generally on AWS-1 rules where applicable, we continue to believe it appropriate to adopt the AWS-1 co-channel interference requirements for AWS-4. Thus we adopt the proposed co-channel interference levels and expand § 27.55(a)(1) of the Commission's rules to include the 2180-2200 MHz band. We observe, however, that the assignment approach we adopt below likely will result in an individual licensee obtaining assignments for geographically adjacent AWS-4 EA licenses. In such a scenario, that licensee may choose not to observe this signal strength limit between its geographically adjacent AWS-4 licenses, so long as it complies with other Commission rules and the adjacent affected service area licensee(s) agree(s) to a different field strength.

## **3. Receiver Performance**

93. We decline to address receiver performance issues at this time due to lack of details and discussions in the record. We will continue our efforts to collaborate with multiple stakeholders on receiver performance and establish a path forward based on the various inputs from interested parties, including the final recommendations of the Commission's Technological Advisory Council, Receiver and Spectrum Working Group.

#### **4. Power Limits**

94. The Commission sought comment on appropriate power limits for terrestrial operations in the AWS-4 band. Specifically, the Commission proposed to apply existing AWS-1 power limits for both base and mobile stations in the AWS-4 bands. As discussed below, we adopt the Commission's proposed power limit for base stations. For mobile operations we adopt a power limit of 2 watts total equivalent isotropically radiated power (EIRP) with the additional constraint that total power between 2000-2005 MHz be limited to 5 milliwatts EIRP.

##### **a. Base Stations**

95. We adopt the three base station power limits. As we explain throughout this order, we base our technical rules on those in place for AWS-1 spectrum. The proposed rules are based on those for AWS-1, and we received no comments opposing the rules. Thus, we adopt the proposal to limit AWS-4 base stations to 1640 watts EIRP for emissions less than 1 MHz and 1640 watts/MHz EIRP for emissions over 1 MHz for non-rural areas; the proposal to set AWS-4 power limits for base stations operating in rural areas at the limits specified in 27.50(d)(1-2) of the Commission's rules; and the proposal that AWS-4 base stations with transmit power above 1640 watts EIRP and 1640 watts/MHz EIRP be required to coordinate with users in adjacent AWS blocks located within 120 kilometers. These power limits will help ensure robust service in the AWS-4 bands, while also helping to minimize harmful interference into other bands. No commenters opposed these proposals.

##### **b. Mobile Stations**

96. We adopt the following power limits for AWS-4 mobile operations. First, we adopt a limit of 2 watts equivalent isotropically radiated power (EIRP) for the total power of a device operating in the AWS-4 uplink. Then, to protect future operations in the adjacent 1995-2000 MHz band, we also limit the power of the portion of a device's transmission that falls into 2000-2005 MHz to 5 milliwatts. Our adoption of these requirements is based on the following technical analysis.

97. First, we consider the total mobile power for the AWS-4 uplink band. Although we generally are applying AWS-1 technical rules to AWS-4, here we adopt the 2 watt EIRP power limit proposed by DISH. No party opposed this proposal. We find that DISH is correct in its understanding of the ATC rule, and a 2 watt power limit is more restrictive than the existing ATC rules in the case of large bandwidths, which may be deployed in this band. Conversely, we note that keeping the PSD-based ATC rule would unnecessarily limit flexibility, and it could restrict the use of narrow transmission bandwidths, such as an LTE mobile transmitting on only a few resource blocks. We agree with DISH that a 2 watt EIRP for AWS-4 mobiles will provide adequate protection to PCS mobiles operating at 1990-1995 MHz.

98. Second, as discussed above, to promote the best and highest use of spectrum, to fulfill our statutory obligations, and to maintain consistency with past Commission actions, we determine that it is in the public interest to ensure the efficient and robust use of both the 1995-2000 MHz band and the AWS-4 band, even if that results in adopting targeted rules that partially limit the usability of a portion of the AWS-4 uplink band. For these reasons, above we establish specific attenuation requirements to address interference from AWS-4 OOB into the 1995-2000 MHz band. OOB limits do not, however, address overload issues. Overload interference can occur in a receiver when it receives signals outside of the frequencies of the desired signal, especially if they are of a much higher power than the desired signal. Overload interference can be managed by improving receiver performance through filtering or other techniques, or by placing transmit power limitations on the authorized frequencies of the potential interferer. We find below that a balance of expected improved performance for receivers in 1995-2000 MHz (relative to typical specifications) and establishing power limitations on AWS-4 operations in the 2000-2005 MHz band best mitigates the possibility of mobile-to-mobile interference from the AWS-4 uplink band to the 1995-2000 MHz band.

99. As detailed below, to establish the appropriate power limitations for AWS-4 operations in 2000-2005 MHz we make several calculations. First, we determine the signal level that future mobiles operating in the 1995-2000 MHz band can tolerate in an adjacent band, considering both the desired

signal and the undesired signal levels, that is, the blocking performance. Next, we describe the user environment under which interference can reasonably be prevented. The environment defines the path losses between the interfering AWS-4 mobile and the 1995-2000 MHz receiver. Then, we establish power limits on the AWS-4 mobiles by applying the path losses to the maximum interfering signal level to work back to the allowable transmitter power.

100. Blocking Performance. As the Commission has not yet adopted rules for the 1995-2000 MHz band, and does not have receiver standards for comparable bands, to calculate the level of overload interference that we anticipate future mobile receivers operating in the 1995-2000 MHz band will tolerate we must turn to other sources. With the rapid adoption of 4G mobile broadband technologies, LTE is a technology commonly being deployed today. We use the 3GPP specifications for LTE user equipment (UE) operating in the nearby PCS band, band 25 (1930-1995 MHz). Although these 3GPP LTE specifications are applicable to user equipment operating in 1930-1995 MHz, not 1995-2000 MHz, and are specific to LTE devices, we feel they are a reasonable indication of the likely performance of future 1995-2000 MHz band devices.

101. In the 3GPP specifications for LTE, blocking performance is specified with a desired signal 6 dB above the reference sensitivity. For a device operating in the 1930-1995 MHz band (band 25) on a 5 megahertz channel, the reference sensitivity is -96.5 dBm. Thus, the desired signal is -90.5 dBm. Next we determine the level of the undesired signal. For interferers on the adjacent channel, the 3GPP standard specifies the ratio of the undesired to desired signal level, termed the adjacent channel selectivity (ACS), rather than an absolute blocking level. For band 25, assuming 5 MHz carriers, the ACS is 33 dB, resulting in -57.5 dBm as the level of undesired signal that the receiver must tolerate.

102. User Environment. The interference scenario that has been discussed in the record is where a handheld AWS-4 mobile transmitter and a handheld PCS mobile receiver are in close proximity. Based on the parameters provided in the comments of Motorola Mobility, which we find reasonable with

the modification that the body loss applies to both devices as discussed above, the characteristics of this environment are:

- Mobiles are separated by 2 meters
- The mobiles are in line of sight conditions, experiencing free space path loss (FSPL)

$$\text{FSPL (dB)} = 20 \log (d) + 20 \log (f) - 27.55,$$

where  $d$  = distance in meters and  $f$  = frequency in MHz.

For a 2 meter separation and 2000 MHz transmit frequency, this translates to

$$\text{FSPL} = 20 \log(2) + 20 \log (2000) - 27.55 = 44.5 \text{ dB},$$

- Each mobile (TxAntGain, RxAntGain) has a combined antenna gain and head/body loss of -10 dB
- Total path losses = TxAntGain + FSPL + RxAntGain = 10 + 44.5 + 10 = 64.5 dB

103. Power Limitation. The allowable transmitter power for AWS-4 is thus calculated by adding the path losses of 64.5 dB to the maximum level of the undesired signal level of -57.5 dBm. Hence, we arrive at a transmitter power level of 7 dBm, which is equivalent to 5 milliwatts. Accordingly, we find that the limit on the total EIRP of AWS-4 mobiles in 2000-2005 MHz must be at most 5 milliwatts. We recognize that carriers larger than 5 MHz may be deployed in the AWS-4 spectrum, and therefore, this power limit may in some cases apply to only a portion of the total power transmitted by the mobile. Therefore, we allow a device to transmit a total of 2 watts EIRP, as long as the portion of the device's transmission in 2000-2005 MHz is limited to an EIRP of 5 milliwatts.

104. Comparison to OOBE limit. To confirm the appropriateness of this limit, we compare the effect of overload interference to the 1995-2000 MHz band to OOBE interference to the 1995-2000 MHz band. As discussed above, we establish an OOBE attenuation of  $70 + 10 \log_{10}(P)$  below 2000 MHz for AWS-4 uplink transmissions. This corresponds to a level of -40 dBm/MHz. Applying the same isolation of 64.5 dB for 2 meters of separation, this means the level present at the 1995-2000 MHz receiver is -104.5 dBm/MHz. This is 3 dB below Motorola's suggested typical noise floor of -101.5



dBm/MHz, consisting of thermal noise of -114 dBm/MHz plus a 12.5 dB noise figure. This is an approximately 2 dB noise rise or desensitization, close to the 3 dB desensitization Motorola recommends as a threshold of interference. So the OOB attenuation of  $70 + 10 \log_{10}(P)$  and power limitation of 5 milliwatts are well balanced, with neither one allowing significantly higher probability of interference than the other.

105. Receiver Improvements. We note that using standard 3GPP blocking specifications, similar analysis would also imply the need for power reductions in 2005-2020 MHz. However, we believe that future equipment for the 1995-2000 MHz band should be able to exceed these specifications, if licensees find it necessary to do so. We impose power restrictions only in the first 5 megahertz because of the difficulty of improving filter performance in the first 5 megahertz adjacent to a band.

106. Private Agreements. We recognize that further improvement of the performance of receivers in 1995-2000 MHz band, as well as willingness on the part of licensees of the 1995-2000 MHz band to accept a higher probability of interference, could reduce or eliminate the need for power restrictions in 2000-2005 MHz. Therefore, we allow for licensees of AWS-4 authority to enter into private operator-to-operator agreements with all 1995-2000 MHz licensees to operate in 2000-2005 MHz at power levels above 5 milliwatts EIRP. In no case, however, may the total power of the AWS-4 mobile emissions exceed 2 watts EIRP.

107. Alternate proposal. As discussed above, DISH also proposed a combination of rules and commitments that it says will allow full use of the 1995-2000 MHz band while preventing any 3GPP delay. In particular, part of this proposal is that DISH will designate 2000-2005 MHz as a terrestrial guard band, and DISH's devices will not transmit on those frequencies. DISH suggests that this will create more certainty for potential bidders on the 1995-2000 MHz band than a power limitation such as we adopt here, and that its proposal will therefore increase the usability of that band. However, we do not adopt any rules prohibiting transmission in 2000-2005 MHz, as establishing calibrated technical limits with the flexibility to be modified via private agreements allows technical and business solutions that

increase the usability of this spectrum if needed, whereas a rule such as proposed by DISH would foreclose any productive use of the spectrum. We also do not believe that DISH's proposal will increase the usability of the 1995-2000 MHz band over the rules we adopt here, which adequately protect the 1995-2000 MHz band through a combination of OOB limits and power limitations.

108. In sum, we decline to adopt the proposed power limit of 1 watt EIRP for mobiles. Rather, we set power limits for mobile operations in the 2000-2020 MHz band as follows: the total power of the mobile is limited to 2 watts EIRP for emissions in 2000-2020 MHz, and is limited to 5 milliwatts EIRP for the portion of any emission that falls into 2000-2005 MHz, except as provided for by private agreement between a licensee of AWS-4 operating authority and all 1995-2000 MHz licensees. No party presented data on the costs associated with different mobile power limits. Thus, given the record before us, we conclude that the potential benefits of our adopted mobile station power limit would outweigh any potential costs.

## **5. Acceptance of Interference into the AWS-4 Uplink Band.**

109. As discussed earlier, the Commission looks to maximize the flexible use of both the AWS-4 and the 1995-2000 MHz bands to enable deployment of full, robust, commercial service for mobile broadband. And, as discussed above, to promote the best and highest use of spectrum, fulfill our statutory obligations, and to maintain consistency with past Commission actions, we determine that it is in the public interest to ensure the efficient and robust use of both the 1995-2000 MHz band and the AWS-4 band, even if that results in adopting targeted rules that partially limit the usability of a portion of the AWS-4 uplink band. To this end, we have prescribed both power and emission limits on the AWS-4 mobile transmitters to prevent interference to the mobile receivers in the 1995-2000 MHz band. The Commission anticipates that the new technical rules to be provided in a forthcoming rulemaking for operation in the 1995-2000 MHz band will address interference to AWS-4 operations. Even with appropriate technical rules and good engineering practice, where uplink and downlink operations are so closely located, there will remain a potential for base stations in the 1995-2000 MHz band to interfere

with the AWS-4 base station receivers. Further, although we are not adopting rules limiting the operations of MSS mobile transmitters, the proximity of uplink and downlink operations also raises the potential for 1995-2000 MHz band base stations to interfere with MSS satellite receivers. Therefore, to the extent that future operations in the 1995-2000 MHz band, operating within the rules established for use of the 1995-2000 MHz band, cause harmful interference to AWS-4 operations or MSS operations due to either OOB in the 2000-2005 MHz portion of the AWS-4 and 2 GHz MSS uplink band or in-band power in 1995-2000 MHz, AWS-4 and 2 GHz MSS licensees must accept this interference.

110. We emphasize that we limit the acceptance of OOB interference to the 2000-2005 MHz portion of the AWS-4 and 2 GHz MSS bands. However, should in band interference occur due to the power in 1995-2000 MHz overloading receivers above 2000 MHz, this overload can potentially affect the entire receive band. Overload interference can be prevented by improved receive filters. Therefore, if a licensee of AWS-4 operating authority determines such filters are necessary, the impact to the uplink band is limited to the transition band of the filter, not the entire band. Such a transition band would be less than 5 megahertz, thus the impact would be limited to (at most) the 2000-2005 MHz portion of the AWS-4 bands, and there is no legacy equipment impact, as ATC service has not been deployed. Finally, we note that unlike the terrestrial service, MSS has been deployed in this band, with two satellites launched. Because both satellites were launched well after the Commission initiated the H block proceeding, we expect that they were designed with this overload scenario in mind. Therefore, there should be no impact to MSS. To the extent this is not the case, we do not expect to limit use of 1995-2000 MHz due to any limitations of receivers deployed after our proceeding on use of 1995-2000 MHz was opened.

111. Thus, for the public interest reasons discussed above and because Congress requires us to make available via a system of competitive bidding the 1995-2000 MHz band, we find that the costs of the tailored limitations on the use of the 2000-2005 MHz portion of the AWS-4 band as well as possibly

some portion of the 2 GHz MSS band are outweighed by the benefits of enabling full use of the 1995-2000 MHz band and of the 2005-2020 MHz portion of the AWS-4 band.

## **6. Antenna Height Restrictions**

112. In the AWS-4 NPRM, the Commission proposed that the flexible antenna height rules applicable to AWS-1 should be also applied to AWS-4 stations. In response, only DISH commented on this issue. As explained below, we adopt the Commission's proposals with minor modifications.

113. Base Stations. We find that, consistent with the Commission's proposal, specific antenna height restriction for AWS-4 base stations are not necessary. As discussed above, the general requirement to not endanger air navigation and the effective height limitations implicitly resulting from our co-channel interference rules obviate the need for specific antenna height restrictions for AWS-4 base stations. Additionally, the sole commenter on this issue supports the Commission's position. Thus, we find specific antenna height restrictions for AWS-4 base stations are not required.

114. Fixed Stations. DISH suggests that a height restriction is not necessary for AWS-4 fixed stations, because the uplink operations of AWS-4 will be more similar to BRS/EBS than AWS-1. The 10 meter height limit was adopted in AWS-1 specifically to protect the Federal operations in the 1710-1755 MHz band and the adjacent Federal bands above and below. Outside of this specific case, the Commission has not found a 10 meter height restriction necessary for other terrestrial mobile bands, such as BRS/EBS or PCS. No other comments were received on this issue. Because the AWS-4 uplink band at 2000-2020 MHz is not adjacent to Federal operations, and to promote flexibility in the use of AWS-4 spectrum, we decline to adopt a height limitation for fixed stations in the AWS-4 uplink band.

## **7. Canadian and Mexican Coordination**

115. Because of our shared border with Canada and Mexico, the Commission routinely works in conjunction with the United States Department of State and Canadian and Mexican government officials to ensure efficient use of the spectrum as well as interference-free operations in the border areas.

Until such time as any adjusted agreements, as needed, between the United States, Mexico and/or Canada can be agreed to, operations must not cause harmful interference across the border, consistent with the terms of the agreements currently in force. The list of agreements includes the “Protocol Concerning the Transmission and Reception of Signals from Satellites for the Provisions of Mobile-Satellite Services and Associated Feeder links in the United States of American and the United Mexican States.” We note that further modifications of the rules might be necessary in order to comply with any future agreements with Canada and Mexico regarding the use of these bands.

## **8. Other Technical Issues**

116. In addition to the specific technical issues addressed above, the Commission also proposed applying additional part 27 rules to the AWS-4 band. Specifically, the Commission proposed applying the following rule sections: §§ 27.51 Equipment authorization, 27.52 RF safety, 27.54 Frequency stability, 27.56 Antennas structures; air navigation safety, and 27.63 Disturbance of AM broadcast station antenna patterns. The Commission reasoned that because AWS-4 will be a part 27 service, these rules should apply to all licensees of AWS-4 terrestrial authority, including those who acquire licenses through partitioning or disaggregation. No commenters opposed this proposal. Accordingly, because these rules generally apply to all part 27 services, and because, as we explain below, we find it appropriate to license the AWS-4 spectrum under our part 27 regulatory framework, we conclude that the potential benefits of our proposal would outweigh any potential costs and adopt the proposal to apply these additional part 27 rules to licensees of AWS-4 authority.

### **C. Protection of MSS Operations**

117. We adopt a rule concerning protection of MSS operations in the 2 GHz band. The rule requires that AWS-4 operations not cause harmful interference to 2 GHz MSS operations and accept any interference received from duly authorized 2 GHz MSS operations. Further, with no commenters opposing the proposed MSS protection rules, we conclude that the benefits of these rules would outweigh

any potential costs. As detailed more fully below, the approach adopted also involves reliance upon rapid terrestrial build-out by the licensees, with potential loss of MSS interference protection in the event terrestrial services are not built out. This approach is incompatible with deployment of additional MSS systems in the band, and therefore we do not anticipate accepting applications for new or modified MS operations, except from an incumbent operator or its assignee or transferee. Accordingly, we delegate authority to the International Bureau to dismiss, upon acceptance by the incumbent MSS licensees of modified license authorizing AWS-4 operations, the “Consolidated Petition for Reconsideration of Inmarsat Ventures Limited and Inmarsat Global Limited,” filed January 9, 2006, in IB Docket Nos. - 50220 and 05-221. That petition sought reconsideration premised on the deployment of an additional MSS system in the 2 GHz MSS bands. Finally, we observe that, should a licensee of AWS-4 operating authority who also possesses 2 GHz MSS operating authority fail to satisfy its AWS-4 Final Build-out Requirement in an EA, among other things, the MSS protection rule (discussed in this paragraph) shall not apply to that EA.

**D. Assignment of AWS-4 Operating Authority**

118. License assignment refers to the process by which the Commission grants an entity the right to use specified channels or frequencies of radio transmission for a specified period of time; no ownership right is conveyed to the licensee. See 47 CFR 2.1. Sections 307-309 of the Communications Act generally govern the initial assignment of licenses. See 47 U.S.C. 307-309. Section 316 governs the modification of Commission licenses. See 47 U.S.C. 316. As discussed below, we propose to modify, pursuant to our Section 316 authority, the incumbent 2 GHz MSS authorization holders’ licenses to include AWS-4 terrestrial spectrum rights.

119. Specifically, we propose to modify the existing MSS licenses to add part 27 rights and obligations for AWS-4 terrestrial spectrum use with all of the attendant rights, limitations, and obligations associated with the AWS-4 service rules we adopt herein. We find that a section 316 license modification

approach is the best course of action because it is the most efficient and quickest path to enabling flexible terrestrial use of this band while ensuring compliance with the MSS protection rule described above.

120. As explained below, we believe that technological difficulties continue to make it impractical today for same band, separate mobile satellite and terrestrial operator sharing of this spectrum, and therefore propose to modify the existing MSS licenses so that satellite and terrestrial services are managed by the same operator. We observe, however, that it may become possible for such same band, separate operator sharing to become technically feasible in the future. For this reason, and for other reasons discussed below, we find it appropriate to permit licensees of AWS-4 operating authority to utilize the Commission's wireless secondary market mechanisms with respect to their terrestrial operating authority.

## **1. Background**

121. In 2003, the Commission established the ATC rules, concluding that any grant of ATC authority would only be to MSS incumbents. The Commission limited ATC authority to the existing MSS licensees because, in part, it determined that separately controlled MSS and terrestrial mobile operations (*i.e.*, two ubiquitous mobile services) in the same band would be "impractical and ill-advised" as the two distinct parties would be unable to overcome technical hurdles to reach a workable sharing arrangement. Technical analyses at the time, moreover, demonstrated that granting a third party the right to use licensed MSS spectrum for terrestrial use could not occur without impacting the rights of the existing satellite licensees.

## **2. Discussion**

122. Section 316 License Modification. As discussed below, we reaffirm the Commission's earlier technical findings regarding same-band, separate operator sharing between mobile satellite and terrestrial operations in this band. We believe that such a sharing scenario generally remains impractical at this time and would inappropriately affect the rights of the existing MSS authorization holders.

Evidenced by the broad support among commenters for the proposed license modification approach, we conclude that the Commission's initial proposal to grant terrestrial authority to operate in the AWS-4 band to the current 2 GHz MSS licensees, through section 316 license modifications, is appropriate and will serve the public interest, convenience, and necessity.

123. Of the numerous parties who commented on this issue, only NTCH opposes the license modification procedure outright. We disagree with NTCH, and explain our reasoning below.

124. Legal Authority. In the AWS-4 NPRM, the Commission proposed modifying the 2 GHz MSS licensees' authority to operate in the AWS-4 bands by adding the authority to operate part 27 terrestrial services. This approach is consistent with the Commission's broad license modification authority, existing precedent, and the record. We therefore adopt the Commission's proposal to issue an Order of Proposed Modification, which accompanies this Report and Order, to modify the existing 2 GHz MSS licenses to include terrestrial operating authority in the AWS-4 spectrum upon the effective date of the service rules adopted herein.

125. Section 316 grants the Commission authority to modify a license if the modification promotes "the public interest, convenience, and necessity." See 47 U.S.C. 316(a)(1). The D.C. Circuit has explained the authority granted by section 316 to be a "broad power to modify licenses; the Commission need only find that the proposed modification serve the public interest, convenience and necessity." California Metro Mobile Communications v. FCC, 365 F.3d 38, 45-46 (D.C. Cir. 2004). This broad nature includes eliminating harmful interference, or the potential for such interference, as an accepted basis for ordering wholesale license modifications.

126. Numerous commenters support the Commission's proposal to exercise this authority here. For example, PIO states that the Commission "has ample legal authority under Title III...to modify spectrum licenses at any time." DISH comments that the license modification is consistent with both FCC precedent and the Communications Act, and that it is within the Commission's purview to modify the authorizations under section 316. Globalstar states that courts have confirmed the broad nature of



Congress's grant of authority under section 316 to modify licenses when doing so serves the public interest. Moreover, even MetroPCS, who opposes, in part, the proposed approach, comments that the Commission is within its authority to modify licenses in order to improve spectrum utilization.

127. Grant of AWS-4 terrestrial operating authority to the 2 GHz MSS licensees will expand the amount of spectrum available for stand-alone terrestrial mobile broadband by 40 megahertz, while also reducing the potential for interference between existing satellite and new terrestrial operations in the band. Both reducing potential interference and increasing spectrum available for mobile broadband serve the public interest. To further ensure that modifying these licenses serves the public interest, we impose performance requirements and other license conditions, which will help to ensure the AWS-4 spectrum is used to provide consumers with mobile broadband service. Therefore, as explained in greater detail below, we conclude both that the Commission has the authority under section 316 to modify the 2 GHz MSS licenses to add terrestrial rights and that so modifying these licenses will serve the public interest.

128. As discussed herein, the Commission is proposing to modify the 2 GHz MSS licenses to establish more uniform configuration and duplex spacing, one that will be consistent with the configuration of the spectrum for terrestrial use. We undertake this modification pursuant to section 316, which provides the Commission with the authority to modify licenses, including by rearranging licensees within a spectrum band. As evidenced by the 800 MHz proceeding, for example, the Commission previously has exercised this authority to modify a license to include authority to operate on new frequencies—there the Commission modified Nextel's authorization to add the 1990-1995 MHz band, 70 FR 76704, December 28, 2005. Additionally, the Commission modified licenses to relocate operations of certain Digital Electronic Message Service licensees from the 18 GHz band to the 24 GHz band, in order to accommodate Department of Defense military systems, 62 FR 24576, May 6, 1997. In modifying licenses to rearrange the MSS duplex spacing, the Commission must meet the public interest, convenience, and necessity requirements of section 316, which we do here for the reasons detailed below. Here, our action to reconfigure an existing band among existing licensees is of a much more limited

nature than in previous exercises of Section 316 authority, such as the 800 MHz re-banding for Nextel. Indeed, although the 2000-2020 MHz and 2180-2200 MHz bands are currently assigned to two different licensees, Gamma Acquisitions L.L.C. (Gamma) and New DBSD Satellite Services G.P. (New DBSD), both of these licensees are wholly owned subsidiaries of DISH. As the satellites are under common control, the modification and resulting recalibration of the satellites should present a minimal burden to the existing licensees. We direct these licensees to determine how to effectuate the reconfiguration of the 2 GHz MSS band into an A-B/A-B arrangement. Providing the licensees with the ability to determine how to best effectuate the MSS band reconfiguration should further limit any burden the reconfiguration places on them. Thus, we will modify the respective licenses of Gamma and New DBSD to reflect the assignment of the paired spectrum as 2000-2010 MHz paired with 2180-2190 MHz and 2010-2020 MHz paired with 2190-2200 MHz, based on the licensees' responses to the Order of Proposed Modification herein.

129. Public Interest Considerations. In the AWS-4 NPRM, the Commission expected modification of the 2 GHz MSS licenses would yield certain public interest benefits, including the removal of regulatory barriers that impede the Commission's goal of terrestrial mobile broadband services in the 2 GHz band. The Commission proposed that if current technology did not permit separate MSS and terrestrial mobile licensees, then license modifications pursuant to section 316 would make more spectrum available for broadband use and avoid harmful electromagnetic interference. As discussed below, to benefit the public interest, we adopt our proposal to modify the 2 GHz MSS licenses pursuant to section 316.

130. Making More Spectrum Available for Flexible Mobile Use. As the Commission has observed, the availability and quality of wireless broadband services is likely to become constrained if additional spectrum is not made available to enable network expansion and technology upgrades. The National Broadband Plan notes that, should additional mobile terrestrial spectrum not become available, the result could be higher prices, poor service quality, an inability for the U.S. to compete effectively on

an international basis, depressed demand and, ultimately, a drag on innovation. Although the Commission previously envisioned the 2 GHz MSS band being available to respond to the demand for spectrum, including through the development of the ATC regime, to date commercial use of this spectrum remains virtually non-existent. Therefore, to improve the public interest benefits of the 2 GHz spectrum, the Commission proposed authorizing terrestrial operations in this spectrum. Granting the 2 GHz MSS operators the ability to provide more and better services to both existing and potentially new subscribers with the same amount of spectrum improves the efficiency with which they can use the spectrum. For example, DISH has commented that use of this spectrum for satellite service is most likely to be in conjunction with terrestrial service.

131. We emphasize that, although our determination to grant AWS-4 authority to the incumbent 2 GHz MSS licensees will undoubtedly result in an increase in value of those licensees, such increase in value is not a basis for our decision today; rather, it is a consequence of our decision, which is intended to enable AWS-4 spectrum to be meaningfully and timely put to use in a manner that promotes the public interest. We believe that various aspects of the rules we are adopting will create additional public benefits in consideration of the increase in the spectrum value. We deem the Section 316 license modification approach the best and fastest method for bringing this spectrum to market, a position underscored by commenters. Thus, we conclude Section 316 license modifications are in the public interest.

132. Additionally, the technical requirements that we are adopting today for 2000-2005 MHz operations will help make the adjacent band, 1995-2000 MHz, available for terrestrial, flexible use, including for mobile broadband use. The Commission allocated 1995-2000 MHz for fixed and mobile use in 2003 and designated it for AWS use in 2004 as a downlink band paired with 1915-1920 MHz. The existence of uplink operations adjacent to downlink operations, however, raises interference concerns; we resolve those through the establishment of technical and interference rules above. Further, the Spectrum Act requires the Commission to license the 1995-2000 MHz band under flexible use service rules, unless

doing so would cause interference to PCS licensees in the 1930-1995 MHz band. Enabling this band to be used efficiently for flexible, commercial use is consistent with this statutory requirement. Moreover, as explained above, wireless broadband traffic is asymmetrical with more downlink than uplink; thus the public interest is best served by limiting uplink operations at 2000-2005 MHz to facilitate potential downlink operations at 1995-2000 MHz, particularly where such a downlink band could become part of the workhorse PCS band. Accordingly, we conclude Section 316 license modifications are in the public interest.

133. Finally, we disagree with NTCH's assertion that the license modification approach we take is not in the public interest. NTCH argues the Commission's proposed actions are inappropriate and that we should accept competing applications for AWS-4 spectrum. NTCH, however, ignores the critical detail that same-band, separate operator sharing of the spectrum is not technically feasible at this time. Moreover, nothing we do today eliminates the existing mobile satellite allocation for the 2 GHz MSS band or limits the licensees' continued satellite use rights for this spectrum (other than certain targeted technical restrictions applicable to 2000-2005 MHz). The Commission recognized these technical hurdles when it established co-primary fixed and mobile allocations in the 2 GHz band. Therefore, to make more spectrum in this band available for flexible terrestrial use, including for mobile broadband, and thereby serve the public interest, we will authorize AWS-4 operations by the incumbent 2 GHz MSS licensees through license modifications. To the extent NTCH suggests the Commission remove the MSS allocation in the 2 GHz band, we consider that request to be an untimely Petition for Reconsideration of the 2 GHz Band Co-Allocation Report and Order.

134. Eliminating Harmful Interference. The Commission previously determined that separately controlled MSS and terrestrial operations (i.e., two ubiquitous mobile services) in the same band would be impractical because the parties would not be able to overcome the technical hurdles to reach a workable sharing arrangement. This determination suggested that the public interest would be best served by modifying the 2 GHz MSS license to allow the satellite licensee to operate terrestrial

services, rather than make the band available for terrestrial licenses under a sharing regime with MSS. As discussed below, the record demonstrates that the earlier Commission conclusion regarding the impracticality of allowing same spectrum, different operator use of the AWS-4 spectrum remains valid. The majority of commenters discussing this issue concur with the Commission's assessment that harmful interference would occur if the 2 GHz MSS and AWS-4 terrestrial spectrum rights were controlled by different entities. Thus, we conclude that the public interest is best served by modifying the 2 GHz MSS license rather than allowing shared use of the band. Accordingly, based on the record before us at this time, we decline to assign AWS-4 terrestrial rights through a system of competitive bidding.

135. One party opposes the Commission's proposal that shared use of the AWS-4 spectrum remains infeasible. MetroPCS argues that the current technology environment actually allows for sharing the AWS-4 spectrum between different operators. MetroPCS suggests that use of known technologies, such as advance coding and interference cancellation and mitigation techniques, would allow for greater interference protection for satellite handsets from terrestrial broadcasts. Additionally, MetroPCS asserts that because MSS satellites "are essentially 'bent pipes,' satellite and terrestrial operators will be able to coordinate their systems in a way that was not originally contemplated when the Commission decided that sharing was not feasible." Although MetroPCS is correct that DISH's satellites use a "bent pipe" architecture where the satellite is essentially repeating a signal generated on the ground, MetroPCS does not clarify how this would facilitate coordination. Contrary to MetroPCS's assertions, we find the record demonstrates continued technical hurdles exist. As DISH notes, although such technologies do allow for greater interference protection, they are "*only* feasible when operations are integrated . . . [and] the reverse link interference cancellation technique...is not a viable solution in the absence of integration, as it requires real-time knowledge of signals for this interference to be prevented." Similarly, as NRTC notes, the technology necessary to share spectrum between two separate licensees, such as dynamic spectrum access and cognitive radios, is not market-proven for sharing mobile satellite and terrestrial

operators or addressed in relevant technical standards. Other parties, such as US GIC, comment that the Commission correctly concluded that multiple parties would not be able to overcome technical hurdles.

136. Also, the record contains no evidence that dynamic frequency coordination can be achieved today between separately-controlled MSS and terrestrial networks. Indeed, as DISH notes, no commenter—including MetroPCS—provides technical support that disputes the continued validity of the Commission’s 2003 finding. Rather, as Sprint states, the record engineering analysis presented by DISH “credibly indicates that frequency sharing between separate operations could cause interference between AWS-4 and MSS equipment and transmissions.” Thus, we find that spectrum sharing between separately-licensed MSS and terrestrial operators, while perhaps possible in the future, is not viable today in this spectrum band. Consequently, we conclude that substantial technical hurdles remain, justifying authorizing AWS-4 operations by the incumbent MSS licensees.

137. We emphasize that this public interest determination is based in part on rules that will limit or potentially limit the licensees’ terrestrial use of a five megahertz portion of AWS-4 spectrum to facilitate the use of 1995-2000 MHz. In particular, as explained above, we are imposing increased OOB limits at and below 2000 MHz, reduced power limits for mobile terrestrial operations in 2000-2005 MHz, and requiring an AWS-4 A block licensee to accept interference from duly authorized lawful operations in the 1995-2000 MHz band. We do this to protect future operations in the 1995-2000 MHz band from harmful interference, to ensure the possibility of flexible commercial use of that band, consistent with Congressional direction, and to strike a balance in ensuring the efficient use of all relevant spectrum bands. The Communications Act established “that the Commission’s powers are not limited to the engineering and technical aspects of radio communications.” National Broadcast Co. v. United States, 319 U.S. 190, 215 (1943). Rather, the Communications Act directs the Commission to “encourage the larger and more effective use of radio in the public interest” and to adopt “such rules and regulations and prescribe such restrictions and conditions . . . as may be necessary to carry out the provisions of this Act.” See 47 U.S.C. 303(g), (r). As explained above, we deem it necessary to set these technical limits

to best maximize AWS-4 and 1995-2000 MHz spectrum for flexible terrestrial use by minimizing harmful interference between the bands. We believe the technical rules we adopt today to protect against harmful interference will promote more effective and efficient use of the 1995-2000 MHz band and the AWS-4 band and we believe that the benefits of these rules will outweigh any restrictions on the use of a portion of the AWS-4 uplink band. Moreover, any restrictions on the use of a portion of the AWS-4 band would be more than offset by the considerable increase in flexibility that the authorization holders will receive in obtaining overall terrestrial use rights under the Commission's part 27 flexible use rules instead of under the existing ATC rules.

138. Commenters did not offer specific data on the amount of benefits or costs associated with our proposed authorization of AWS-4 operations by the incumbent MSS licensees. However, because of the technical difficulties associated with coordinating between different AWS-4 licensees and the MSS licensee using the shared spectrum in the same service area, and the requirement discussed above for licensees of AWS-4 operating authority to protect 2 GHz MSS operations from harmful interference, and given the record before us and the benefits discussed above, we conclude that the potential benefits of assigning the AWS-4 spectrum rights to the existing 2 GHz MSS licensees would outweigh any potential costs.

139. Proposed Modification. For the reasons discussed throughout this Report and Order, we conclude that it is in the public interest, convenience, and necessity to propose modifying the existing 2 GHz MSS licenses as described in section V below. These modifications include adding part 27 terrestrial spectrum rights to the 2 GHz MSS licenses, creating more uniform duplex spacing for the MSS rights, and eliminating ATC authority from the licenses. In the unexpected event that the license modification fails to become effectuated, we will take appropriate action at that time, potentially including full reconsideration of the assignment methods contemplated in this item and based on the revised factual scenario such an occurrence would represent.

## **E. Performance Requirements**

140. The Commission establishes performance requirements to promote the productive use of spectrum, to encourage licensees to provide service to customers expeditiously, and to promote the provision of innovative services throughout the license area(s), including in rural areas. Historically, the Commission tailors performance and construction requirements to the unique characteristics of the spectrum band at issue. For the AWS-4 band, we adopt performance requirements that will ensure that the spectrum is put to use expeditiously, while providing licensees with the flexibility needed to deploy services according to their business plans. Specifically, we require:

- **AWS-4 Interim Build-out Requirement:** Within four (4) years, a licensee shall provide reliable terrestrial signal coverage and offer terrestrial service to at least forty (40) percent of its total AWS-4 population. A licensee's total AWS-4 population shall be calculated by summing the population of each of its license areas in the AWS-4 band.
- **AWS-4 Final Build-out Requirement:** Within seven (7) years, a licensee shall provide reliable terrestrial signal coverage and offer terrestrial service to at least seventy (70) percent of the population in each of its license areas.

141. Additionally, we adopt the following penalties for failing to meet the build-out benchmarks:

- **Failure to Meet AWS-4 Interim Build-out Requirement:** Where a licensee fails to meet the aggregate AWS-4 Interim Build-out Requirement, the AWS-4 Final Build-out Requirement shall be accelerated by one year (from seven to six years).
- **Failure to Meet AWS-4 Final Build-out Requirement:** Where a licensee fails to meet the AWS-4 Final Build-out Requirement in any EA, its authorization for each EA in which it fails to meet the requirement shall terminate automatically without Commission action. To



the extent that the licensee also holds the 2 GHz MSS rights for the affected license area, failure to meet the AWS-4 Final Build-out Requirement in an EA shall also result in the MSS protection rule in § 27.1136 of the Commission's rules no longer applying to that EA.

142. We adopt specific performance requirements for the AWS-4 band in an effort to foster timely deployment of flexible terrestrial mobile service in the band, and to enable the Commission to take appropriate corrective action should the required deployment fail to occur. Although the record in response to the Commission's specific performance benchmark and penalty proposals is mixed, parties generally agree that performance requirements promote the timely, productive use of spectrum. Timely deployment of wireless networks in this band is vital given the failure of any terrestrial ATC service and failure of significant MSS to develop despite years of Commission effort to enable deployment of emerging and innovative technologies in the band.

143. We disagree with commenters who argue that our build-out requirements would be of limited value, because they either do not believe the licensee (post license modification) intends to build out using the spectrum or believe that additional conditions are needed to ensure the spectrum is utilized. As an initial matter, we observe that the incumbent 2 GHz MSS licensees generally support our seven year end-of-term build-out benchmark and have committed to "aggressively build-out a broadband network" if they receive terrestrial authority to operate in the AWS-4 band. (DISH Comments, WT Docket Nos. 12-70, 04-356, ET Docket No. 10-142, page 18.) We expect this commitment to be met and, to ensure that it is, adopt performance requirements and associated penalties for failure to build-out, specifically designed to result in the spectrum being put to use for the benefit of the public interest. We address requests for conditions in addition to performance requirements below.

144. Benchmarks. To ensure that a licensee provides service to consumers expeditiously, we adopt specific quantifiable performance requirements. Consistent with our approach to performance benchmarks in other bands—including the Upper 700 MHz C-block and the 2.3 GHz WCS band—we adopt objective interim and final build-out benchmarks. As explained below, after taking into account the

full range of comments, we adopt an interim requirement that differs somewhat from that proposed in the AWS-4 NPRM and adopt the final benchmark proposal in the AWS-4 NPRM.

145. Interim Benchmark. We modify the proposed interim build-out requirement in response to the record. Recognizing concerns raised by commenters that the proposal may not afford a new entrant in a new flexible use terrestrial band sufficient time to deploy its network and offer service, we extend the interim build-out requirement timeframe from three to four years. Extending the interim benchmark to four years will enable service providers and equipment vendors to deploy network infrastructure and devices based on the most advanced technologies, including the LTE-Advanced standard. This is analogous to the Commission's decision in the 2012 WCS Order in which the Commission extended the proposed build-out requirements by six months to accommodate new technological developments. 27 FCC Rcd 13641 (2012). Extending the interim benchmark from three to four years also accommodates possible timing effects that may result from our technical findings, above, to enable use of the adjacent 1995-2000 MHz band. We also increase the population benchmark from 30% to 40%, to more closely align the benchmark with interim benchmarks in other bands. Finally, we determine that a licensee's total AWS-4 population shall be calculated by summing the population, based on the most recent decennial U.S. Census Data at the time of measurement, of each of its license areas in the AWS-4 band.

146. Final Benchmark. We find, consistent with the record, that a final seven-year construction milestone provides a reasonable timeframe for a licensee to deploy its network and offer widespread service. No party suggested that a longer time frame would be necessary and, indeed, DISH stated that seven years is a reasonable period for a final build-out milestone. We are not persuaded by T-Mobile's proposal that we require an expedited build-out schedule. Although we expect it is possible for a licensee to meet a faster schedule, we believe such a benchmark could unnecessarily restrict the business plans of licensees, particularly new entrants. Therefore, after assessing the record and Commission precedent, we find that requiring 70% build-out at the seven-year milestone would serve the public interest.

147. As discussed above, we are adopting an EA-based AWS-4 band plan requirement and not a nationwide band plan. Setting build-out benchmarks on an EA basis is consistent with our general approach of assigning AWS-4 terrestrial spectrum rights under the Commission's part 27 rules, including permitting any licensee to avail itself of the Commission's secondary market mechanisms. Consistent with our practice in other bands, we will measure interim and final build-out benchmarks using percentages of license area population. We reject DISH's proposal to measure these benchmarks using static measures of population. This allows for more flexibility and certainty in licensing. For example, should a licensee partition some of its AWS-4 spectrum, a percentage-based approach would apply to each partition, while a single population count would not.

148. Rural Specific Benchmarks. We conclude that no additional rural-specific construction benchmarks are warranted beyond the performance requirements described above. We recognize that some commenters seek stricter performance requirements to promote service to rural areas. However, the performance requirements we adopt today will provide licensees with an ability to scale networks in a cost efficient manner while also ensuring that the vast majority of the population will have access to these wireless broadband services by the final benchmark. Because of the substantial capital investment and logistical challenges associated with a licensee building-out its terrestrial network to a significant percentage of the Nation's population within four and seven years, we conclude that the performance requirements we adopt are an appropriate balance.

149. Penalties for Failure to Meet Construction Requirements. We adopt meaningful and enforceable consequences, or penalties, for failing to meet both the interim and the final benchmarks. The penalties we adopt represent modification of the Commission's main proposal in the AWS-4 NPRM for the penalty for failure to meet in the interim build-out requirement; they reflect the record generated in this proceeding.

150. Penalties for Failure to Meet the Interim Benchmark. We modify the Commission's proposal and find that failure to meet the aggregate AWS-4 Interim Build-out Requirement will result in

the AWS-4 Final Build-out Requirement being accelerated (shortened) by one year. If a licensee of AWS-4 authority fails to meet the interim benchmark, its final build-out benchmark would be reduced to 6 years instead of 7 years. We agree with commenters who suggest that penalties of this nature are appropriate for failure to meet the AWS-4 interim benchmark. In modifying the Commission's proposal from the AWS-4 NPRM, we note the concerns raised by commenters who argued that the proposal to terminate all of a licensee's terrestrial authority for not meeting the Interim Build-out Requirement could impact investment and impact customers.

151. Penalties for Failure to Meet the Final Benchmark. In the event a licensee fails to meet the AWS-4 Final Build-out Requirement in any EA, we adopt the proposal in the AWS-4 NPRM that the licensee's terrestrial authority for each such area shall terminate automatically without Commission action. Automatic termination is a common remedy for failure to build part 27 flexible use licenses. We also adopt the Commission proposal that any licensee who forfeits its AWS-4 operating authority for failure to meet the AWS-4 Final Build-out Requirement in an EA shall be precluded from regaining that authorization. To the extent that a licensee is also the 2 GHz MSS licensee, failure to meet the AWS-4 Final Build-out Requirement in a license area shall also result in the MSS protection rule in § 27.1136 of the Commission's rules no longer applying to that AWS-4 license area. We believe that our approach strikes an appropriate balance between promoting prompt build-out and penalizing a licensee for not meeting its terrestrial performance obligations in a particular EA. In addition, by only terminating specific licenses where a licensee fails to meet the final benchmark in a particular license area, a licensee's customers in other license areas would not be impacted.

152. Moreover, we reject suggestions that MSS interference protections should not be affected by a failure to construct terrestrial services. If we do not remove the protection rule for satellite operations for those geographic areas where the terrestrial operating authority terminates, it will be challenging to relicense the spectrum in a way that will encourage productive terrestrial use. This could

create incentives for the current licensees not to comply with the construction benchmarks and could potentially cause the spectrum to continue to lay fallow of terrestrial use contrary to the public interest.

153. We believe these penalties are necessary to ensure that licensees utilize the spectrum in the public interest. As explained above, the Nation needs additional spectrum supply. Failure by licensees to meet the build-out requirements would not address this need. Commenters did not offer specific data on the amount of benefits or costs associated with our proposed penalties or any alternative penalties for failure to meet performance requirements. We disagree that the penalties could potentially discourage network investment for the licensee or lower the service quality for terrestrial wireless service customers. While a customer might lose service if a licensee loses its terrestrial spectrum rights for failure to build-out, we expect that a future licensee of AWS-4 authority for that EA would ultimately serve more customers. We expect the probability of not meeting the performance requirements due to the costs of meeting the rules to be small and that the performance penalties are unlikely to deter network investment. Moreover, the Commission has consistently dismissed the contention that an automatic termination policy is unfair; rather, it is the same approach that the Commission applies to nearly all geographically-licensed wireless services. The Commission has specifically rejected the argument that the automatic termination penalty would deter capital investment, noting that the wireless industry has invested billions of dollars and has flourished under this paradigm.

154. “Use it or Share it.” We decline to impose any “use it or share it” requirements for the AWS-4 spectrum band. PIO argues that the Commission’s build-out requirements should be “augmented by a ‘use it or share it’ license condition that would permit other parties to make use of unused” AWS-4 spectrum on a localized basis until the licensee actually begins providing service. While we reserve the right to implement “use it or share it” obligations in the future, “use it or share it” is a complex concept that is not sufficiently developed in this record. Even though we do not adopt a requirement, we encourage providers to enter into leasing agreements for unused spectrum. While we discuss spectrum leasing in greater detail below, we note that engaging in spectrum leasing may assist a licensee in meeting

its performance milestones. We also note that we asked a number of questions about “use or lease” in the Incentive Auctions NPRM and hope to build a more robust record in that proceeding about how such a process could work effectively, 77 FR 69934, Nov. 21, 2012.

155. Compliance Procedures. After assessing the record, we find that licensees must demonstrate compliance with the new performance requirements by filing a construction notification within 15 days of the relevant milestone certifying that they have met the applicable performance benchmark, consistent with § 1.946(d) of the Commission’s rules. See 47 CFR 1.946(d). Further, we find that each construction notification must include electronic coverage maps and supporting documentation, which must be truthful and accurate and must not omit material information that is necessary for the Commission to determine compliance with its performance requirements. Finally, we decline to require, as suggested by T-Mobile, that any licensee file certifications every six months regarding its construction progress; such frequent reporting is unnecessary to ensure intensive spectrum use given the performance measures we adopt today.

156. Electronic coverage maps must accurately depict the boundaries of each license area in the licensee’s service territory. See 47 CFR 27.14(p)(7). If a licensee does not provide reliable signal coverage to an entire EA, its map must accurately depict the boundaries of the area or areas within each EA not being served. Each licensee also must file supporting documentation certifying the type of service it is providing for each EA within its service territory and the type of technology used to provide such service. Supporting documentation must include the assumptions used to create the coverage maps, including the propagation model and the signal strength necessary to provide reliable service with the licensee’s technology.

157. Further, the licensee must use the most recently available decennial U.S. Census Data at the time of measurement to meet the population based build-out requirements. See 47 CFR 27.14(h). Specifically, the licensee must base its claims of population served on areas no larger than the Census Tract level. This requirement tracks the Commission’s action requiring broadband service providers to

report “snapshots” of broadband service at the Census Tract level twice each year by completing FCC Form 477.

**E. Applications for Any AWS-4 Spectrum Returned to the Commission**

158. Certain requirements adopted in this Report and Order create the potential for AWS-4 spectrum rights to be terminated automatically or otherwise returned to the Commission’s spectrum inventory for reassignment. For example, this Report and Order adopts consequences, including the loss of terrestrial use of, and satellite protection for, the spectrum, if a licensee fails to meet certain build-out requirements. Such returned AWS-4 terrestrial spectrum rights would be reassigned using a geographic-area approach with licenses to be made available on an EA basis. In such a situation, consistent with the proposal set forth in the AWS-4 NPRM, we adopt a licensing process that provides for the acceptance of mutually exclusive applications, which would be resolved by means of competitive bidding pursuant to the statutory directive. The Commission has long recognized that where mutually exclusive applications are submitted this type of framework best serves the public interest because the competitive bidding mechanism is most likely to select licensees that value the spectrum the most and will put it to its highest and most efficient use. In the event that AWS-4 spectrum rights are returned to the Commission, we conclude that any such rights will be made available for reassignment for terrestrial use only. As noted above, while we conclude that technological difficulties make it impractical today for same-band sharing of this spectrum between separate mobile satellite and terrestrial operators, we observed that it may become possible for such sharing to become technically feasible in the future. For this reason, and for other reasons discussed herein, including our determination that returned spectrum will not be subject to any MSS protection rule, we find it appropriate to put a framework in place now that would govern the reassignment of AWS-4 spectrum rights. To the extent that the MSS licensee relinquishes its terrestrial spectrum rights either voluntarily or involuntarily the MSS licensee bears the consequences of any interference that occurs as an attendant result of its opening the door to satellite/terrestrial use in the same band by two different licensees. That is, the MSS licensee would be responsible for its own considered

choices or for its failure to fulfill the responsibilities that attends the expansion of its licensed rights into the terrestrial realm. Accordingly, the returned spectrum rights will be subject to the competitive bidding procedures we adopt below and will not be subject to any MSS protection rule.

159. Procedures for Any AWS-4 Licenses Subject to Assignment by Competitive Bidding.

We will conduct any auction for AWS-4 licenses resulting from terrestrial spectrum rights being returned to the Commission pursuant to our standard competitive bidding rules found in part 1, subpart Q of the Commission's rules and will provide bidding credits for qualifying small businesses, as proposed in the AWS-4 NPRM. Below we discuss our reasons for adopting the relevant proposals.

160. Application of Part 1 Competitive Bidding Rules. The Commission proposed to conduct any auction for AWS-4 licenses in conformity with the general competitive bidding rules set forth in part 1, subpart Q, of the Commission's rules, and substantially consistent with the competitive bidding procedures that have been employed in previous auctions. Additionally, the Commission proposed to employ the Part 1 rules governing competitive bidding design, designated entity preference, unjust enrichment, application and payment procedures, reporting requirements, and the prohibition on certain communications between auction applicants. Under this proposal, such rules would be subject to any modifications that the Commission may adopt for its part 1 general competitive bidding rules in the future. The AWS-4 NPRM also sought comment on whether any part 1 rules would be inappropriate or should be modified for an auction of licenses in the AWS-4 bands.

161. We received no comments on the proposed use of our standard competitive bidding rules for any auction of terrestrial AWS-4 licenses.

162. One commenter, TIA, makes several proposals addressing auction design, such as the use of two-sided auctions and auction vouchers, the use of combinatorial, or package, bidding, and avoiding the use of minimum bids. Consistent with our long-standing approach, auction-specific matters such as the competitive bidding design and specific mechanisms relating to day-to-day auction conduct, including



minimum opening bids and/or reserve prices, would be determined by the Wireless Telecommunications Bureau prior to the start of the auction pursuant to its delegated authority, after providing interested parties an opportunity to comment. Such delegated authority has proven effective over the years in providing flexibility to develop auction procedures in response to auction-specific issues and to respond rapidly to potential bidder concerns that are sometimes of a time-sensitive nature. Consequently, we determine that the Commission's part 1 bidding rules should govern the conduct of any such auction. Given the record before us and the benefits discussed above, we conclude that the potential benefits of our proposal would likely outweigh any potential costs.

163. Small Business Provisions for Terrestrial Geographic Area Licenses. As the AWS-4 NPRM discussed, in authorizing the Commission to use competitive bidding, Congress mandated that the Commission "ensure that small businesses, rural telephone companies, and businesses owned by members of minority groups and women are given the opportunity to participate in the provision of spectrum-based services." In addition, section 309(j)(3)(B) of the Communications Act provides that, in establishing eligibility criteria and bidding methodologies, the Commission shall promote "economic opportunity and competition . . . by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women." One of the principal means by which the Commission fulfills this mandate is through the award of bidding credits to small businesses.

164. In the Competitive Bidding Second Memorandum Opinion and Order, the Commission stated that it would define eligibility requirements for small businesses on a service-specific basis, taking into account the capital requirements and other characteristics of each particular service in establishing the appropriate threshold. Further, in the Part 1 Third Report and Order, the Commission, while standardizing many auction rules, determined that it would continue a service-by-service approach to defining the eligibility requirements for small businesses.

165. The Commission proposed in the AWS-4 NPRM to define a small business as an entity with average gross revenues for the preceding three years not exceeding \$40 million, and a very small business as an entity with average gross revenues for the preceding three years not exceeding \$15 million. Under this proposal, small businesses would be provided with a bidding credit of 15 percent and very small businesses with a bidding credit of 25 percent, consistent with the standardized schedule in part 1 of our rules.

166. This proposal was modeled on the small business size standards and associated bidding credits as the Commission adopted for the AWS-1 band. The Commission premised this proposal on the belief that the AWS-4 spectrum, assigned in geographic area licenses, would be employed for purposes similar to those for which the AWS-1 band is used. In response to the AWS-4 NPRM's request for comment on these proposals, including the costs or benefits of these standards and associated bidding credits, especially as they relate to the proposed geographic areas, the Commission received no comment. Based on our prior experience with the use of bidding credits in spectrum auctions, we believe that the use of bidding credits is an effective tool in achieving the statutory objective of promoting participation by designated entities in the provision of spectrum-based services. In the absence of small business size standards and bidding credits, designated entities might have less opportunity to obtain spectrum in this band. The Commission believes that continuing to extend such benefits to AWS-4 would be consistent with our statutory mandate. In light of the similarities with the AWS-1 service, we adopt these size standards and associated bidding credits for small businesses in the event that AWS-4 licenses are awarded through competitive bidding. On December 5, 2012, we requested the U.S. Small Business Administration's approval of our final rule adopting these small business size standards.

167. We received two comments in response to the AWS-4 NPRM's request for comment on whether to use a different approach to bidding credits. Commenters addressed eligibility in differing ways. NTCH proposes adopting eligibility rules that would preserve a 20 megahertz license for entities with less than \$100 million in assets, with the remaining 20 megahertz block available for all bidders.

Council Tree proposes that in the absence of “set aside blocks” of AWS-4 spectrum for bidding only by designated entities, that the Commission adopt significantly higher bidding credits, with discounts up to 45 percent. Council Tree proposed bidding credits of 25% to businesses with average annual gross revenues not exceeding \$40 million; 35% for businesses with revenues not exceeding \$15 million; and 45% to businesses with revenues not exceeding \$3 million. This proposal is premised on Council Tree’s own assessment of the Commission’s designated entity program. The Commission has made clear that it is unpersuaded by Council Tree’s claims with respect to the performance of designated entities in recent auctions. Therefore, although we address Council Tree’s proposals for the AWS-4 band, we decline to address again such claims, which are not the subject of this proceeding. The Commission has previously rejected suggestions for spectrum “set-asides” in rulemaking proceedings, concluding that it was unnecessary to supplement the incentives provided for small business participation by foreclosing licenses to other bidders. In the AWS-4 NPRM, the Commission acknowledged the difficulty in accurately predicting the market forces that might exist at the time that these frequencies are licensed, but the Commission is not persuaded that it is necessary to either set aside a portion of the spectrum at issue now, or adopt significantly larger bidding credits, in order to encourage the full participation of designated entities. We therefore adopt our proposals relating to small businesses. Given the record before us and the benefits discussed above, we conclude that the potential benefits of our proposals would likely outweigh any potential costs.

#### **F. Regulatory Issues; Licensing and Operating Rules**

168. The regulatory framework we adopt below establishes the license term, criteria for renewal, and other licensing and operating rules pertaining to the AWS-4 bands. In the AWS-4 NPRM, the Commission proposed to grant licensees of AWS-4 operating authority the flexibility to provide any fixed or mobile service consistent with the allocations for this spectrum. The Commission also proposed to license this spectrum under the Commission’s market-oriented part 27 rules, and generally to apply the

provisions of the Commission's part 27 rules applicable to AWS and the Commission's wireless rules generally applicable across multiple commercial bands to AWS-4 spectrum.

**1. Flexible Use, Regulatory Framework, and Regulatory Status.**

169. Below, we adopt regulations to provide licensees of AWS-4 operating authority with the flexibility to provide any terrestrial fixed or mobile service that is consistent with the allocation and service rules for AWS-4 spectrum. We also determine to license the AWS-4 spectrum under the Commission's market-oriented part 27 rules and apply the regulatory status provisions of § 27.10.

170. Flexible Use. In order to promote innovative broadband services and encourage the flexible and efficient use of the AWS-4 band, we will allow a licensee of AWS-4 authority to utilize the spectrum for any terrestrial use permitted by the United States Table of Frequency Allocations contained in part 2 of the Commission's rules, provided that the licensee complies with the applicable service rules. We find that this determination fully meets the criteria of Section 303(y) and that the record unanimously supports our permitting flexible use of the AWS-4 spectrum. See 47 U.S.C. 303(y).

171. First, as required by section 303(y)(1), flexible use of this band is consistent with applicable international agreements. See 47 U.S.C. 303(y)(1). Such use would remain subject to bilateral discussions commonly undertaken whenever spectrum is put to use in border areas.

172. Second, as required by section 303(y)(2), flexible use is in the public interest because it would not deter—and, indeed, we expect it will stimulate—investment in broadband, and it would not result in harmful interference. See 47 U.S.C. 303(y)(2). We agree with commenters who state, for example, that flexibility will promote broadband deployment, ensure the spectrum is put to its most beneficial use, and maximize the probability of success for new services to be provided in the AWS-4 band. Similarly, we expect that flexibility will allow any licensee of AWS-4 authority to respond to consumer demand in a manner that maximizes the spectrum's value to both the public and the licensee.

173. Similarly, we believe flexibility will spur investment in communications services and systems and technology development. We find that permitting licensees to use this spectrum for any use permitted by the spectrum's allocation will not deter investment in communications services and systems, or technology development. The record in this proceeding unambiguously supports this determination.

174. We also find that permitting licensees' flexible use of the AWS-4 spectrum will not result in harmful interference among spectrum users. The technical rules we adopt today reflect careful consideration of potential interference scenarios and the overall public interest. Further, the flexibility we are permitting will itself provide licensees with the ability to adjust their operations to minimize any interference that might occur. Our technical rules for the AWS-4 band will permit licensees to provide a wide variety of services in these bands with a minimum of interference, and will permit both in-band (if any) and adjacent-band licensees to operate with sufficient certainty and clarity regarding their rights and responsibilities. Because we are adopting technical restrictions to protect other spectrum users, this proposal will not result in harmful interference. Accordingly, the standards of section 303(y)(2) are satisfied here. See 47 U.S.C. 303(y)(2). Commenters did not offer specific data on the amount of benefits or costs associated with our proposal for flexible use of the AWS-4 band. Given unanimous supports in the record and the potential benefits discussed above, we conclude that the potential benefits of our proposal would outweigh any potential costs.

175. Regulatory Framework. We determine to license the AWS-4 spectrum under part 27 because these rules provide a broad and flexible regulatory framework for licensing spectrum, thereby enabling the spectrum to be used to provide a wide variety of broadband services. This light-handed regulatory approach permits licensees to use the spectrum for a multitude of purposes across the country and provides licensees with the ability to change technologies in response to changes in market conditions.

176. The record unanimously supports this approach. The flexibility provided under part 27 should allow licensees to design their systems to respond readily to consumer demand, thus allowing the

marketplace to dictate the best uses of the licensed spectrum. Commenters did not offer specific data on the amount of benefits or costs associated with our proposal to apply the part 27 rules to the AWS-4 band. Given unanimous support in the record and the potential benefits discussed above, we conclude that the potential benefits of our proposal would outweigh any potential costs.

177. Regulatory Status. No commenters directly addressed the application of § 27.10 of the Commission's rules to the AWS-4 band. See 47 CFR 27.10. Commenters, however, overwhelmingly support increased regulatory flexibility and applying the part 27 rules to the AWS-4 band. We believe that by applying § 27.10 of the Commission's rules to the AWS-4 band we will achieve efficiencies in the licensing and administrative process, and provide licensees with additional flexibility. Therefore, we adopt the proposal from the AWS-4 NPRM to apply § 27.10 of our rules to the AWS-4 band.

178. Under this flexible regulatory approach, licensees in the AWS-4 band may provide common carrier, non-common carrier, private internal communications or any combination of these services, so long as the provision of service otherwise complies with applicable service rules. This broad licensing framework will encourage licensees to develop new and innovative services with minimal regulatory restraint.

179. To fulfill our enforcement obligations and to ensure compliance with Titles II and III of the Communications Act, we require the licensee to identify the regulatory status of the service(s) it intends to provide. Consistent with § 27.10 of the Commission's rules, the licensee will not be required to describe its particular services, but only to designate the regulatory status of the service(s). We remind potential licensees that an election to provide service on a common carrier basis requires that the elements of common carriage be present; otherwise the applicant must choose non-common carrier status. If a potential licensee is unsure of the nature of its services and whether classification as common carrier is appropriate, it may submit a petition with its applications, or at any time, requesting clarification and including service descriptions for that purpose.

180. We also determine that if the licensee elects to change the service or services it offers such that its regulatory status would change, it must notify the Commission and must do so within 30 days of making the change. A change in the licensee's regulatory status will not require prior Commission authorization, provided the licensee is in compliance with the foreign ownership requirements of section 310(b) of the Communications Act that apply as a result of the change. See 47 U.S.C. 310(b). We note, however, that a different time period (other than 30 days) may apply, as determined by the Commission, where the change results in the discontinuance, reduction, or impairment of the existing service.

## **2. Ownership Restrictions**

181. Foreign Ownership. Based on our statutory responsibilities, we determine that all licensees of AWS-4 authority shall be subject to the provisions of § 27.12 of the Commission's rules. See 47 CFR 27.12. All such entities are subject to section 310(a) of the Communications Act, which prohibits licenses from being "granted to or held by any foreign government or the representative thereof." See 47 U.S.C. 310(a). In addition, as applicable here, a licensee that would provide a common carrier, aeronautical en route, or aeronautical fixed service in this band would also be subject to the foreign ownership and citizenship requirements in section 310(b) of the Communications Act. See 47 U.S.C. 310(b).

182. We did not receive any comments opposing our proposal that applicants for this band be required to provide the same foreign ownership information in their filings, regardless of the type of service the licensee would provide using its authorization. Since we are adopting a flexible approach to licensing the AWS-4 band, we determine that all licensees will be subject to the same requirements for filing foreign ownership information in their applications. Therefore, we will require all licensees to provide the same foreign ownership information, which covers both sections 310(a) and 310(b) of the Communications Act, regardless of whether the licensee will provide common carrier or non-common carrier service. We note, however, that we would be unlikely to deny a license to an applicant requesting

to provide exclusively services that are not subject to section 310(b), solely because its foreign ownership would disqualify it from receiving a license if the applicant had applied for authority to provide such services.

183. Eligibility and Mobile Spectrum Holding Policies. The Commission has previously determined in a number of services that eligibility restrictions on licenses may be imposed only when open eligibility would pose a significant likelihood of substantial harm to competition in specific markets and when an eligibility restriction would be effective in eliminating that harm. This approach relies on market forces absent a compelling showing that regulatory intervention to exclude potential participants is necessary.

184. There is nothing in the record indicating that open eligibility in the AWS-4 band would pose a significant likelihood of substantial competitive harm in the broadband services market. Therefore, consistent with our findings on this issue for other spectrum bands, we find that open eligibility in this band is consistent with our statutory mandate to promote the development and rapid deployment of new technologies, products, and services; economic opportunity and competition; and the efficient and intensive use of the electromagnetic spectrum. The open eligibility is also consistent with section 6404 of the Spectrum Act. Given the record before us, we conclude that the potential benefits of open eligibility would outweigh any potential costs.

185. The Commission recently opened a general rulemaking proceeding to broadly examine its policies and rules regarding mobile spectrum holdings, 77 FR 61330, October 9, 2012. Given that recently-initiated proceeding, we decline to address here the narrower issue of how to assess AWS-4 spectrum holdings for purposes of spectrum concentration analysis. During the pendency of the Mobile Spectrum Holdings Policies proceeding, we will continue to apply our case-by-case approach to secondary market transactions and initial license applications as necessary.

### **3. Secondary Markets**



186. Partitioning and Disaggregation. The Commission’s part 27 rules generally allow for geographic partitioning and spectrum disaggregation. Geographic partitioning refers to the assignment of geographic portions of a license to another licensee along geopolitical or other boundaries. Spectrum disaggregation refers to the assignment of a discrete amount of spectrum under the license to another entity. Disaggregation allows for multiple transmitters in the same geographic area operated by different companies on adjacent frequencies in the same band. As the Commission noted when first establishing partitioning and disaggregation rules, allowing such flexibility could facilitate the efficient use of spectrum by providing licensees with the flexibility to make offerings directly responsive to market demands for particular types of services, increase competition by allowing market entry by new entrants, and expedite provision of services that might not otherwise receive service in the near term. We conclude that a licensee of AWS-4 authority should have the same ability to partition its service territories and disaggregate its spectrum as other wireless licensees and, therefore will allow any such licensee to partition its service areas or to disaggregate its spectrum to the extent permitted by § 27.15 of the Commission’s rules. See 47 CFR 27.15. We acknowledge that, as the record indicates, there may be technical and coordination complexities associated with partitioning and disaggregation specific to the satellite overlay that exists in the band. Although these coordination and technical issues are real—indeed, they are central to our assignment determinations, above—the fact that we will assign AWS-4 operating authority to the 2 GHz MSS licensees mitigates against the need to prohibit partitioning or disaggregation. Additionally, the MSS interference protection rule we adopt above will “run with the license,” obligating any partitionee or disaggregatee to avoid interference with MSS operations.

187. To the extent that a licensee of AWS-4 authority develops the ability (through technical advances or coordination measures) to ensure that an AWS-4 partitionee or disaggregatee would not cause harmful interference to MSS operations, we find no basis to restrict it from entering into partitioning or disaggregation arrangements in the same manner as other part 27 licensees.

188. As explained above and in the AWS-4 NPRM, the Commission determined that, based on the facts in this band, a grant of AWS-4 operating authority to a third party would potentially compromise the existing rights of existing satellite licensees. A private party licensee, however, is free to choose voluntarily to enter into a business relationship that includes its agreeing to not pursue all of its rights or even to encumber some of its rights. This is particularly so, if the licensee's forgoing of its rights furthers larger Commission goals. Stated otherwise, while we decline to grant AWS-4 authority to parties in a manner that would undermine the existing MSS licensees, we find it would be consistent with the Commission's goal of widespread mobile broadband availability to permit an MSS licensee to limit voluntarily its ability to offer satellite service as part of a secondary market arrangement enabling another party to better provide flexible use terrestrial service, including mobile broadband using AWS-4 spectrum. For example, a licensee may determine that it would be best for it to give up its rights to interference protection for its satellite operations for a certain geographic area or a specific portion of its spectrum and permit another licensee to have a license for terrestrial use for the corresponding geographic area or spectrum.

189. Thus, we believe that any licensee of AWS-4 authority should have the same freedom as other wireless licensees to use its licensed spectrum in the way that the licensee determines would make the best business sense through the use of partitioning or disaggregation. A licensee of AWS-4 authority should be permitted the discretion to determine the amount of spectrum it will occupy and the area it will serve consistent with its business plan. Accordingly, we find it in the public interest to permit any licensee of AWS-4 authority to partition any geographic portion of its license area, at any time following the grant of its license, and to also permit any such licensee to disaggregate spectrum in any amount, at any time following the grant of its license.

190. We further conclude that the public interest would be served by requiring each party to a partitioning, disaggregation, or combination of both in the AWS-4 band to individually meet the applicable AWS-4 performance requirements. As the Commission observed in the WRS NPRM, this

approach should lead to more efficient spectrum usage and prevent the avoidance of timely construction through secondary market fiat, while still providing operators with the flexibility to design their networks according to their operational and business needs. In addition, commenters did not offer specific costs associated with the geographic partitioning and spectrum disaggregation rules for the AWS-4 band. Given the benefits discussed above, we conclude that the potential benefits of the partitioning and disaggregation rules would likely outweigh any potential costs.

191. Spectrum Leasing. We find it in the public interest to apply the same comprehensive set of rules, policies, and procedures governing spectrum leasing arrangements between terrestrial licensees and spectrum lessees that we have adopted for other wireless spectrum bands to the AWS-4 band. This decision will encourage innovative arrangements and investment in the AWS-4 band.

192. We extend our secondary leasing policies to both spectrum manager lease arrangements and de facto transfer lease arrangements. For a particular spectrum band, spectrum leasing policies generally follow the same approach as the partitioning and disaggregation policies for the band. In the AWS-4 NPRM, we observed this relationship between partitioning/disaggregation and spectrum leasing, but did not make a specific proposal with respect to whether to permit partitioning and disaggregation of AWS-4 spectrum. Consistent with our determination, above, to permit partitioning and disaggregation of AWS-4 spectrum, we permit spectrum leasing of AWS-4 spectrum, including both categories of spectrum lease arrangements.

193. We acknowledge that in the 2 GHz Band Co-Allocation Order the Commission did not extend the secondary market regime to permit MSS/ATC de facto transfer lease arrangements, 76 FR 31252, May 31, 2012. The facts underlying that decision, however, differ from those here. In the case of MSS/ATC spectrum, terrestrial operations were explicitly ancillary to satellite operations and terrestrial operations were premised on the operator satisfying the ATC gating criteria, some of which require at least a certain amount of control over satellite operations, control an ATC lessee would not be able to exercise. That is not the situation here. The AWS-4 terrestrial spectrum use will not be ancillary to

satellite 2 GHz MSS use. Rather, subject to the technical rules established herein, terrestrial and satellite uses will exist under co-primary allocations and will have equal status. Further, an AWS-4 terrestrial lessee will not be responsible for meeting satellite obligations, including the ATC gating criteria, which we are eliminating (along with the entire ATC regime) for the 2 GHz MSS band. Accordingly, we decline to adopt the Commission's proposal to not permit de facto lease arrangements of AWS-4 spectrum and reject the similar position of a handful of commenters. Instead, for the aforementioned reasons, we permit these lease arrangements, as well as spectrum manager lease arrangements for AWS-4 spectrum. Additionally, the MSS interference protection rule we adopt above will "run" with either type of leasing arrangement, obligating any lessee to avoid interference with MSS operations. Given the record before us, we conclude that the potential benefits of extending these rules, policies, and procedures are likely to outweigh the potential costs.

#### **4. License Term, Renewal Criteria, and Permanent Discontinuance of Operations**

194. License Term. We adopt a license term for AWS-4 spectrum rights of ten years and subsequent renewal terms of ten years and we modify § 27.13 of the Commission's rules to reflect these determinations. See 47 CFR 27.13. We find our decision consistent with the Commission's adoption of ten-year license terms in most other part 27 services and in services using similar spectrum, such as that used for PCS. Thus, in adopting a 10-year license term, we treat holders of AWS-4 spectrum rights similarly to licensees providing like services. Further, no party opposed (or commented on) the Commission's license term proposal.

195. In addition, we require that, in the event that the terrestrial portion of a license is partitioned or disaggregated, any partitionee or disaggregatee will be authorized to hold its license for the remainder of the partitioner's or disaggregator's license term. Although the parties to such an arrangement may agree that the arrangement will terminate prior to the end of the license term, the arrangement may not remain in effect longer than the license term (or any subsequent renewal term).

Thus, we ensure that a licensee, by partitioning or disaggregation, will not be able to confer greater rights on another party than it was awarded by the Commission under the terms of its license grant. This approach is similar to the partitioning and disaggregation provisions the Commission adopted for licensees in other spectrum bands, including for the BRS (formerly MDS), broadband PCS, 700 MHz band, and AWS-1 bands. Accordingly, we conclude that the potential benefits of the proposed license terms would outweigh any potential costs.

196. Renewal Criteria. Pursuant to section 308(b) of the Communications Act, the Commission may require renewal applicants to “set forth such facts as the Commission by regulation may prescribe as to the citizenship, character, and financial, technical, and other qualifications of the applicant to operate the station” as well as “such other information as it may require.” See 47 U.S.C. 308(b). We find that all licensees of spectrum in the AWS-4 band seeking renewal of their authorizations at the end of their license term must file a renewal application, independent of their performance requirements, pursuant to § 1.949 of the Commission’s rules. See 47 CFR 1.949. Commenters did not comment on or address any potential costs associated with the proposed license renewal criteria in the AWS-4 band. Accordingly, we conclude that the potential benefits of the proposed license renewal requirements would outweigh any potential costs.

197. A licensee’s renewal showing is distinct from its performance showing. In the renewal context, the Commission will consider the level and types of a licensee’s service provided over the entire license term, as opposed to measuring services offered at a specific point in time for performance requirements. Thus, a licensee that meets the applicable performance requirements might nevertheless fail to meet the renewal requirements.

198. We require the renewal showing to include a detailed description of the renewal applicant’s provision of service during the entire license period and discuss: (1) the level and quality of service provided by the applicant (e.g., the population served, the area served, the number of subscribers, the services offered); (2) the date service commenced, whether service was ever interrupted, and the

duration of any interruption or outage; (3) the extent to which service is provided to rural areas; (4) the extent to which service is provided to qualifying tribal land as defined in § 1.2110(e)(3)(i) of this chapter; and (5) any other factors associated with the level of service to the public. A licensee must also demonstrate at renewal that it has substantially complied with all applicable Commission rules and policies, and the Communications Act of 1934, as amended, including any applicable performance requirements. The licensee must also maintain the level of service provided at its final performance benchmark to the end of the license term.

199. As we did in the 700 MHz First Report and Order, we will prohibit the filing of mutually exclusive renewal applications, 72 FR 27688, May 16, 2007. If a license is not renewed, the associated spectrum will be returned to the Commission for reassignment.

200. Permanent Discontinuance of Operations. We adopt the Commission's proposal to apply § 1.955(a)(3) of the Commission's rules to any licensee, such that an AWS-4 operator's terrestrial spectrum rights, will automatically terminate, without specific Commission action, if service is "permanently discontinued." See 47 CFR 1.955(a)(3). For AWS-4 spectrum, we define "permanently discontinued" as a period of 180 consecutive days during which a licensee does not operate and does not serve at least one subscriber that is not affiliated with, controlled by, or related to, the provider in an EA. We believe this approach strikes the appropriate balance between a licensee's need for operational flexibility and the need to ensure efficient utilization of licensed spectrum. In addition, our determination will ensure that AWS-4 spectrum does not remain idle for extended periods. Rather, it will facilitate business and network planning by providing certainty to licensees and their investors. The discontinuance rule will apply commencing on the date a licensee must meet its final performance requirement benchmark, thereby providing a licensee with adequate time to construct its terrestrial network.

201. Furthermore, in accordance with § 1.955(a)(3) of the Commission's rules, if a licensee permanently discontinues service, the licensee must notify the Commission of the discontinuance within

10 days by filing FCC Form 601 or 605 and requesting license cancellation. We emphasize, however, that an authorization will automatically terminate without specific Commission action if service is permanently discontinued even if a licensee fails to file the required form requesting license cancellation.

202. Finally, in applying § 1.955(a)(3) to licensees of AWS-4 authority, we clarify that operation of so-called channel keepers, e.g., devices that transmit test signals, tones and/or color bars, do not constitute operation for purposes of the permanent discontinuance rules.

203. Other Operating Requirements. Although we are generally adopting part 27 rules for the AWS-4 band, in order to maintain general consistency among various wireless communication services, we also require any licensee of AWS-4 operating authority to comply with other rule parts that pertain generally to wireless communication services. For example, § 27.3 of the Commission's rules lists some of the other rule parts applicable to wireless communications service licensees generally; we thus find it appropriate to apply this and similar rules to the AWS-4 band. Some of these other rule parts will be applicable by virtue of the fact that they apply to all licensees, and others will apply depending on the type of service a licensee provides. For example: applicants and licensees will be subject to the application filing procedures for the Universal Licensing System, set forth in part 1 of our rules; licensees will be required to comply with the practices and procedures listed in part 1 of our rules for license applications, adjudicatory proceedings, etc; licensees will be required to comply with the Commission's environmental provisions, including § 1.1307; licensees will be required to comply with the antenna structure provisions of part 17 of our rules; to the extent a licensee provides a Commercial Mobile Radio Service, such service is subject to the provisions of part 20 of the Commission's rules, including 911/E911 and hearing-aid compatibility requirements, along with the provisions in the rule part under which the license was issued. Part 20 applies to all CMRS providers, even though the stations may be licensed under other parts of our rules; and the application of general provisions of parts 22, 24, or 27 will include rules related to equal employment opportunity, etc. No commenter opposes this approach.

204. Facilitating Access to Spectrum and the Provision of Service to Tribal Lands. We defer the application of any rules and policies for facilitating access to spectrum and the provision of service to Tribal Lands to the Tribal Lands proceeding, 67 FR 18476, Apr. 4, 2011. The Tribal Lands proceeding, being specifically focused on that issue, is better suited than the instant proceeding to reach conclusions on that issue.

## **5. Other Matters—Proposed Party Conditions**

205. Mandatory Wholesale and Roaming Requirements. Several commenters requested that the Commission impose mandatory wholesale and roaming requirements on licensees of AWS-4 operating authority. We decline to impose any mandatory wholesale and roaming requirements in this Report and Order. We find these requests beyond the scope of the service rules proceeding before us and would be better addressed in other, non-band specific, proceedings on those topics. For example, roaming requirements for wireless spectrum licensees are the subject of other Commission proceedings. We also note that we have recently initiated a proceeding to broadly examine our policies and rules regarding mobile spectrum holdings, including possible remedies to address potential harms or to help ensure the realization of potential benefits.

206. Wholesale Restrictions. A number of commenters proposed that, in order to promote competition and prevent the entrenchment of duopoly power, the Commission should impose restrictions on the amount of AWS-4 spectrum that a licensee may make available for access to a particular wireless service provider. We decline to impose restrictions on the ability of a licensee of AWS-4 authority to provide access to its AWS-4 traffic capacity to other wireless carriers in this proceeding. We believe that this issue is beyond the scope of this proceeding. We also note that we have recently initiated a proceeding to broadly examine our policies and rules regarding mobile spectrum holdings.

207. Penalties for Early License Transfers. Some commenters seek the imposition of unjust enrichment penalties if a licensee of AWS-4 authority sells or otherwise transfers control of its license to



one of the two largest mobile data carriers within a specified time period. We will not, in this proceeding, adopt a system for imposing unjust enrichment penalties in the event that a licensee of AWS-4 operating authority seeks to transfer its license to one of the two largest mobile data providers. Nor will we impose additional restrictions on the licensee's ability to transfer or otherwise assign its terrestrial spectrum rights. Rather, the Commission will continue to review any proposed transfers of control or assignments of AWS-4 authority under its requirements then in place. Finally, we note that we have recently initiated a proceeding to examine spectrum concentration issues and that, during the pendency of this proceeding, we will continue to apply our case-by-case approach to secondary markets transactions and initial license applications as necessary.

## **G. Relocation and Cost Sharing**

### **1. Emerging Technologies Policies**

208. The Emerging Technologies (ET) procedures represent a broad set of tools that the Commission uses to aid the process of making spectrum available for new uses. Generally, the Commission applies the ET procedures when it is necessary to relocate incumbent licensees to introduce new services into a frequency band. The Commission sets a "sunset date"—a date by which incumbent licensees may not cause interference to new band entrants. Prior to the sunset date, the new entrants may negotiate with incumbents to gain early entry into the band and, if necessary, may relocate the incumbents to comparable facilities. Because new entrants may have to relocate incumbents from a larger frequency range or greater geographic area than where the new entrants will operate, the Commission also typically establishes a companion set of cost-sharing procedures. These procedures allow the operators that have relocated incumbents to be reimbursed a portion of their relocation expenses from new entrants that benefit from the spectrum clearance. The application of specific relocation and cost sharing processes under the ET framework generally varies for each frequency band, and is based on the types of incumbent licensees and particular band characteristics. We discuss, below, the particular relocation and cost

sharing procedures that we adopt for the 2000-2020 MHz and 2180-2200 MHz bands. Relocation and Cost-Sharing for 2000-2020 MHz

209. Background. The lower portion of the AWS-4 band (2000-2020 MHz) is part of the 1990-2025 MHz band that the Commission reallocated from the Broadcast Auxiliary Service (BAS) to emerging technologies such as PCS, AWS, and MSS. Consistent with the relocation principles first established in the Commission's Emerging Technologies proceeding, each new entrant had an independent responsibility to relocate incumbent BAS licensees. Sprint Nextel (Sprint), which is the PCS licensee at 1990-1995 MHz, completed the BAS transition for the entire 35 megahertz in 2010. In 2011, Sprint notified the Commission that it entered in a private settlement with DISH to resolve its dispute with MSS licensees with respect to MSS licensees' obligation to reimburse Sprint for their share of the BAS relocation costs.

210. Discussion. We find that no additional relocation or cost-sharing procedures are necessary for the 2000-2020 MHz AWS-4 band. In addition, although we do not adopt cost-sharing rules in this Report and Order, we clarify that AWS-2 licensees will continue to be responsible for reimbursing Sprint for 2/7th of the BAS relocation costs (*i.e.*, the proportional share of the costs associated with Sprint relocating 10 megahertz of BAS spectrum that may be used by AWS-2 entrants) and that such cost-sharing issues will be addressed in a separate proceeding.

211. Relocation. As explained in the AWS-4 NPRM, Sprint undertook the relocation of BAS from the entire 35 megahertz at 1990-2025 MHz and notified the Commission that this transition was completed in 2010. No party raised outstanding relocation issues, unrelated to cost-sharing (which is discussed below), for the 1990-2025 MHz band in response to the AWS-4 NPRM. Therefore, we find no need to adopt additional relocation procedures for the 1990-2025 MHz band.

212. Cost Sharing. Even though Sprint only benefits from the use of five megahertz of spectrum (1990-1995 MHz), Sprint incurred significant costs in clearing the remaining thirty megahertz of spectrum (1995-2025 MHz) to the benefit of other entrants. The Commission has consistently

affirmed its general cost-sharing policy that an entrant who has relocated incumbents from reallocated spectrum is entitled to reimbursement for a portion of the band clearing costs from other entrants benefitting from that relocation. The Commission has emphasized that all entrants to the 1990-2025 MHz band may be required to bear a proportional share of the costs incurred in the BAS clearance, on a pro rata basis according to the amount of spectrum each entrant is assigned. Of the total 35 megahertz of spectrum, five megahertz was authorized for PCS and held by Sprint; 10 megahertz is authorized for (but yet to be auctioned and licensed as) AWS-2; and 20 megahertz was authorized for MSS. Sprint clarified in the record that DISH satisfied the cost-sharing obligations associated with 20 megahertz of spectrum in the 1990-2025 MHz band and that the only remaining cost-sharing obligations in this band are attributable to the 10 megahertz of spectrum authorized for AWS-2.

213. We conclude that, consistent with the Commission's policy that all entrants to the 1990-2025 MHz band bear a proportional share of the costs incurred in the BAS clearance on a pro rata basis according to the amount of spectrum each entrant is assigned, future AWS-2 licensees who enter the band prior to the sunset date will be responsible for reimbursing Sprint for  $2/7^{\text{th}}$  of the BAS relocation costs (i.e., the proportional share of the costs associate with Sprint relocating 10 megahertz of BAS spectrum that will be used by AWS-2 entrants). Each five megahertz block of spectrum in the 1990-2025 MHz band represents one-seventh of the relocated BAS spectrum. Sprint has stated that the pro rata share of the overall BAS relocation costs attributable to each five megahertz of relocated BAS spectrum amounts to \$94,875,516. We believe that this determination represents the most fair and balanced approach for all parties. The Commission will address the application on these cost-sharing obligations on AWS-2 licensees, including Sprint's proposal to set the sunset date for reimbursement at ten years after the issuance of the first AWS licenses in these bands separately in the H Block NPRM.

## **2. Relocation and Cost Sharing for 1915-1920 MHz.**

214. We defer cost-sharing issues for the 1915-1920 MHz band until we establish service rules for that band, which we expect to do in the near future.

### **3. Relocation and Cost-Sharing for 2180-2200 MHz**

215. Background. The upper portion of AWS-4 (2180-2200 MHz) is part of the 2160-2200 MHz band that the Commission previously reallocated from the Fixed Microwave Services (FS) to emerging technologies. The Commission's licensing records show approximately 700 active FS licenses in the 2180-2200 MHz band and that most of these incumbents appear to be state or local governmental entities, utilities, railroads, and other businesses with FS links licensed in the Microwave Public Safety Pool (MW) or the Microwave Industrial/Business Pool (MG) for private, internal communication. FS links in the 2180-2200 MHz band typically are paired, for two-way operation, with FS links in the 2130-2150 MHz band. The Commission previously adopted relocation and cost-sharing rules for AWS-1 licensees in the 2110-2155 MHz band, and we proposed in the AWS-4 NPRM to adopt similar rules for licensees of AWS-4 operating authority to govern relocation and cost-sharing in the 2180-2200 MHz band.

216. Relocation. We adopt rules for the relocation of FS incumbents from the 2180-2200 MHz band by an AWS-4 entrant based on similar rules that apply to the relocation of FS incumbents from the 2110-2155 MHz band by AWS-1 licensees. We also establish a 10-year sunset date from the grant of the first license or issuance of a modification of a license to authorize the use of the 2180-2200 MHz band for AWS-4 under part 27. We received minimal comment on this issue.

217. Under the AWS-4 service rules that we are adopting, the MSS/AWS-4 licensee will be required to build a terrestrial network to serve a large portion of the country. Thus, the deployment of a ubiquitous AWS-4 network creates a much greater certainty that incumbents would need to relocate from the band than might have been anticipated under the existing MSS/ATC regime. Because of the large number of FS incumbents still present in the band, we find that it serves the public interest to impose an obligation on an AWS-4 entrant to relocate FS incumbents from the 2180-2200 MHz band, and that this obligation should be independent and distinct from the existing MSS/ATC relocation obligation. Consequently, this relocation obligation shall not sunset at the December 2013 date applicable under the

MSS/ATC rules but instead shall be determined by the AWS-4 relocation rules which we are now adopting.

218. Although FS incumbents in the 2180-2200 MHz band were subject to relocation by MSS licensees, we find it appropriate to impose relocation obligations on licensees of AWS-4 authority at this time because we now adopt service rules for a new wireless terrestrial service under Part 27. The Commission generally adopts relocation procedures at the time that it adopts rules for the provision of new services in bands that are used by incumbent licensees. The MSS/ATC relocation rules are based on unique circumstances that were only applicable to MSS. The Commission departed from its traditional relocation rules in adopting a mandatory negotiation period for relocation of FS incumbents by MSS licensees in the 2180-2200 MHz band as well as providing a specific date for the start of the ten-year sunset period instead of the issuance of the first license or start of the first relocation negotiations. The Commission believed that the modifications to the traditional relocation/negotiation procedures was warranted due to the presence of special circumstances specific to MSS and hoped that it would expedite the relocation of FS incumbents from the 2180-2200 MHz band. The Commission also has stated that those special circumstances are not applicable to relocations by AWS licensees and declined to depart from the traditional trigger for determining the mandatory negotiation period and the sunset dates for the relocation of FS incumbents by AWS licensees.

219. Although FS incumbents had considerable notice that they would likely need to relocate their services, we are not persuaded that this should be the predominant factor in our decision. We note that, under the ET procedures, the date at which the incumbents first received notice that they would be relocated has not determined the starting date for the relocation sunset period. For example, when the Commission allocated spectrum for AWS, including at 2130-2150 MHz in 2002, and thereafter adopted service rules, modified relocation rules, and adopted cost-sharing rules, it continued to impose an obligation on AWS-1 licensees to relocate FS incumbents at 2130-2150 MHz for ten years from the date on which the first AWS-1 license was granted, even though those FS incumbents were already on notice

that they would be subject to relocation. Similarly, the Commission decided to relocate BAS incumbents in the 1990-2025 MHz band to make way for MSS in 1997, but did not begin the ten-year relocation period until 2000 and later extended the sunset date to 2013.

220. For all of the reasons discussed above, we conclude that it is in the public interest to adopt relocation rules for licensees of AWS-4 authority, including the trigger for determining the mandatory negotiation period and the sunset date for relocation obligations, that are based on our traditional Emerging Technologies proceedings and similar to rules that have governed the relocation of incumbent licensees by AWS-1 licensees and other terrestrial wireless licensees. We believe that our action will promote a harmonized approach under part 27 to the relocation of FS incumbents by terrestrial wireless licensees across the AWS bands and will provide FS incumbents in the 2180-2200 MHz band with a meaningful opportunity to negotiate relocation agreements with a licensee of AWS-4 authority.

221. The specific rules that we adopt, as explained above, are based on similar rules that apply to the relocation of FS incumbents from the 2110-2155 MHz band by AWS-1 licensees. No parties commented on modifying the proposed rules themselves. In general, licensees of AWS-4 authority will be required to coordinate their frequency usage with all potentially affected co-channel and adjacent channel FS incumbents operating in the 2180-2200 MHz band prior to initiating operations from any base or fixed station. If interference would occur, the licensee of AWS-4 authority can initiate a mandatory negotiation period (two-years for non-public safety, three-years for public safety) during which each party must negotiate in good faith for the purpose of agreeing to terms under which the FS licensees would: (1) relocate their operations to other fixed microwave bands or other media; or alternatively (2) accept a sharing arrangement with the licensee of AWS-4 authority that may result in an otherwise impermissible level of interference to the FS operations. If no agreement is reached during the mandatory negotiation period, the licensee of AWS-4 authority can initiate involuntary relocation procedures.

222. We also establish a 10-year sunset date from the grant of the first license or issuance of a modification of a license to authorize the use of the 2180-2200 MHz band for AWS-4 under part 27. We

addressed arguments raised by DISH with respect to the sunset above. In addition, we adopt our proposal to delete the reference in footnote NG168 in the U.S. Table of Frequency Allocations to all Fixed and Mobile facilities operating on a secondary basis not later than December 9, 2013. No parties commented on our proposal to modify this footnote. As we explained in the AWS-4 NPRM, grandfathered fixed microwave systems will be governed by the procedures in § 101.79 after the applicable sunset date.

223. Cost-Sharing. We extend the cost-sharing rules adopted for AWS-1 licensees to the AWS-4 band. This will result in the cost-sharing requirements sunsetting on the same date as the relocation obligations. The Commission has emphasized that it is desirable to harmonize the FS relocation procedures among the various AWS designated bands to the greatest extent feasible. The Commission specifically noted that relocation procedures that are consistent throughout the band can be expected to foster a more efficient rollout of AWS and minimize confusion among the parties, and thereby serve the public interest. We believe that adopting rules based on the part 27 cost-sharing rules that apply to AWS-1 licensees will accelerate the relocation process and promote rapid deployment of new advanced wireless services in the band. The part 27 cost-sharing rules were designed to accommodate the deployment of new wireless terrestrial services and have a proven record of success. We also observe that the Commission refined the part 27 cost-sharing plan based on the experience and record of the cost-sharing plan that applied to PCS under part 24. We therefore believe that our adoption of similar rules in this instance will expedite the relocation of FS incumbents and the introduction of new services. We further find that this approach will serve the public interest because it will distribute relocation costs more equitably among the beneficiaries of the relocation, encourage the simultaneous relocation of multi-link communications systems, and accelerate the relocation process, thereby promoting more rapid deployment of new services. Accordingly, we adopt rules in based on the formal cost-sharing procedures codified in part 27 of our rules to apportion relocation costs among those entrants that benefit from the relocation of FS incumbents in the 2180-2200 MHz band.

224. Consistent with our proposal to extend the cost-sharing rules adopted for AWS-1 licensees to the AWS-4 band, we also adopt rules to permit for voluntary self-relocating FS incumbents to obtain reimbursement from those licensees of AWS-4 authority benefiting from the self-relocation. Incumbent participation will provide FS incumbents with the flexibility to relocate themselves and the right to obtain reimbursement of their relocation costs, adjusted by depreciation, up to the reimbursement cap, from new AWS-4 entrants in the band. Incumbent participation also will accelerate the relocation process by promoting system wide relocations and result in faster clearing of the band, thereby expediting the deployment of new advanced wireless services to the public. Therefore, we require licensees of AWS-4 authority to reimburse FS incumbents that voluntarily self-relocate from the 2110-2150 MHz and 2160-2200 MHz bands and AWS licensees will be entitled to pro rata cost sharing from other AWS licensees that also benefited from the self-relocation.

225. With respect to cost-sharing obligations on MSS operators for FS incumbent self-relocation in the 2180-2200 MHz band, we recognize that the Commission previously declined to impose cost sharing on MSS operators for voluntary self-relocation by FS incumbents in that band. Accordingly, for FS incumbents that elect to self-relocate their paired channels in the 2130-2150 MHz and 2180-2200 MHz bands, we will impose cost-sharing obligations on AWS licensees but not on MSS operators. Where a voluntarily relocating microwave incumbent relocates a paired microwave link with paths in the 2130–2150 MHz and 2180–2200 MHz, it may not seek reimbursement from MSS operators but is entitled to reimbursement from the first AWS beneficiary for its actual costs for relocating the paired link, subject to the reimbursement cap in § 27.1164(b). This amount is subject to depreciation as specified in § 27.1164(b). An AWS licensee who is obligated to reimburse relocation costs under this rule is entitled to obtain reimbursement from other AWS beneficiaries in accordance with §§ 27.1164 and 27.1168. For purposes of applying the cost-sharing formula relative to other AWS licensees that benefit from the self-relocation, depreciation shall run from the date on which the clearinghouse issues the notice of an obligation to reimburse the voluntarily relocating microwave incumbent.



226. We require AWS-4 relocators to file their reimbursement requests with the clearinghouse within 30 calendar days of the date the relocator signs a relocation agreement with an incumbent. Terrestrial operations trigger incumbent microwave relocations on a link-by-link basis, and the Commission imposed a mandatory requirement that all terrestrial operators—AWS and MSS ATC—that relocate FS incumbents from the 2110-2150 MHz and 2160-2200 MHz bands use a clearinghouse. No party proposed that we modify the rules requiring the use of a clearinghouse by terrestrial wireless licenses for cost-sharing. The clearinghouses have considerable experience in determining the cost-sharing obligation of AWS and other ET entities for the relocation of FS incumbents from the 2110-2150 MHz and 2160-2200 MHz bands, and the Commission selected clearinghouses to serve as neutral third-parties in the cost-sharing process. We continue to believe that a mandatory requirement will allow the clearinghouses to accurately track cost-sharing obligations as they relate to all terrestrial operations and expedite the relocation of FS incumbents from the 2180-2200 MHz band by minimizing disputes over the reimbursement of those costs. For similar reasons and consistent with precedent, we will also require self-relocating microwave incumbents in the 2180-2200 MHz band to file their reimbursement requests with the clearinghouse within 30 calendar days of the date that they submit their notice of service discontinuance with the Commission.

227. We further require all licensees of AWS-4 authority that are constructing a new site or modifying an existing site to file site-specific data with the clearinghouse prior to initiating operations for a new or modified site. The site data must provide a detailed description of the proposed site's spectral frequency use and geographic location. We will also impose a continuing duty on those entities to maintain the accuracy of the data on file with the clearinghouse. We find that such an approach will ensure fairness in the process and preclude new AWS-4 entrants from conducting independent interference studies for the purpose or effect of evading the requirement to file site-specific data with the clearinghouse prior to initiating operations.

228. Utilizing the site-specific data submitted by licensees of AWS-4 authority, the clearinghouse determines the cost-sharing obligations of each entrant by applying the Proximity Threshold Test. We find that the presence of an entrant's site within the Proximity Threshold Box, regardless of whether it predates or postdates relocation of the incumbent, and regardless of the potential for actual interference, will trigger a cost-sharing obligation. Accordingly, any entrant that engineers around the FS incumbent will trigger a cost-sharing obligation once relocation of the FS incumbent occurs.

229. Consistent with precedent, we establish a specific date on which the cost-sharing plans that we adopt here will sunset. We find that the sunset date for cost sharing purposes is the date on which the relocation obligation for the subject band terminates. Although we realize that we are adopting a sunset date that differs from the sunset date for cost-sharing obligations of AWS-1 licensees, we find that establishing sunset dates for cost sharing purposes that are commensurate with the sunset date for AWS relocation obligations in each band appropriately balances the interests of all affected parties and ensures the equitable distribution of costs among those entrants benefiting from the relocations. We reiterate, however, that AWS entrants that trigger a cost-sharing obligation prior to the sunset date must satisfy their payment obligation in full.

230. We continue to require participants in the cost-sharing plan to submit their disputes to the clearinghouse for resolution in the first instance. Where parties are unable to resolve their issues before the clearinghouse, parties are encouraged to use expedited ADR procedures, such as binding arbitration, mediation, or other ADR techniques. Except for the independent third party appraisal of the compensable relocation costs for a voluntarily relocating microwave incumbent and documentation of the relocation agreement or discontinuance of service required for a relocater or self-relocater's reimbursement claim, both of which must be submitted in their entirety, we require participants in the cost-sharing plan to provide only the uniform cost data requested by the clearinghouse subject to the continuing requirements that relocators and self-relocators maintain documentation of cost-related issues until the sunset date and

provide such documentation, upon request, to the clearinghouse, the Commission, or entrants that trigger a cost-sharing obligation. In addition, we also require that parties of interest contesting the clearinghouse's determination of specific cost-sharing obligations must provide evidentiary support to demonstrate that their calculation is reasonable and made in good faith. Specifically, these parties are expected to exercise due diligence to obtain the information necessary to prepare an independent estimate of the relocation costs in question and to file the independent estimate and supporting documentation with the clearinghouse.

231. We expect new entrants and incumbent licensees to act in good faith in all matters relating to the cost-sharing process herein established. Although the Commission has generally required "good faith" in the context of parties' participation in negotiations, self-relocating incumbents benefit through their participation in the cost-sharing regime and therefore we expect them to act in good faith in seeking reimbursement for recoverable costs in accordance with the Commission's rules. We find that the question of whether a particular party was acting in good faith is best addressed on a case-by-case basis. By retaining sufficient flexibility to craft an appropriate remedy for a given violation in light of the particular circumstances at hand, we can ensure that any party who violates our good faith requirements, either by acting in bad faith or by filing frivolous or harassing claims of violations, will suffer sufficient penalties to outweigh any advantage it hoped to gain by its violation.

#### **IV. ANCILLARY TERRESTRIAL COMPONENT IN THE 2 GHz MSS BAND**

232. We eliminate the ATC rules for the 2 GHz band and delete the former footnote NG168 (now numbered NG43) from the U.S. Table of Allocations. We conclude that authorizing two, distinct terrestrial mobile operations in the band would result in confusion and redundancy. Furthermore, the changing circumstances in the 2 GHz MSS band demonstrate that ATC regulations are no longer the best framework for developing and deploying terrestrial broadband operations in the band. Finally, the record reflects no opposition to our adopting the proposals. We therefore conclude that the potential benefits of our proposals would outweigh any potential costs. In eliminating the ATC rules for the 2 GHz MSS

band, we emphasize that our action does not result in changes to the ATC rules for either the L-band or the Big LEO band; rather, we intend to address issues pertaining to the ATC rules for those bands in one or more separate proceedings at a later date.

## **V. ORDER OF PROPOSED MODIFICATION**

233. As noted above, although the 2000-2020 MHz and 2180-2200 MHz bands are currently assigned to two different licensees, Gamma Acquisitions L.L.C. (Gamma) and New DBSD Satellite Services G.P. (New DBSD), both licenses are wholly owned subsidiaries of DISH. In paragraph 175 above, we direct these 2 GHz MSS licensees to determine how to effectuate the reconfiguration of the 2 GHz MSS band into an A-B/A-B arrangement by each licensee selecting a duplex pair in response to this Order of Proposed Modification. For the reasons discussed throughout this Report and Order, we conclude that it is in the public interest, convenience, and necessity to propose modifying the existing 2 GHz MSS licenses as follows:

- To modify the 2 GHz MSS licenses of Gamma Acquisition L.L.C. (call sign E060430) and New DBSD Satellite Services G.P. (call sign E070272) to reflect the duplex pairing that each licensee selects in its response to this Order of Proposed Modification, consistent with paragraph 175, above;
- To add AWS-4 terrestrial operating authority, as detailed in this Report and Order and Order of Proposed Modification, to the 2 GHz MSS licenses of both Gamma Acquisition L.L.C. (call sign E060430) and New DBSD Satellite Services G.P. (call sign E070272) consistent with the 2 GHz MSS licensees' duplex pairing selections;
- To require Gamma Acquisition L.L.C. and New DBSD Satellite Services G.P. to accept any OOB interference to MSS or terrestrial operations in 2000-2005 MHz from lawful operations from future 1995-2000 MHz licensees;

- To require Gamma Acquisitions L.L.C. and New DBSD Satellite Services G.P. to accept any in band interference in some or all of 2000-2020 MHz from lawful operations from 1995-2000 MHz licensees; and
- To eliminate the ATC authority in the 2000-2020 MHz and 2180-2200 MHz spectrum bands of both Gamma Acquisition L.L.C. and New DBSD Satellite Services G.P.

234. In this connection, we believe that the proposed license modifications would serve the public interest by allowing for additional terrestrial broadband spectrum, while minimizing harmful interference. In accordance with section 316(a) of the Communications Act, as amended, and § 1.87(a) of the Commission's rules, we will not issue a modification order(s) until Gamma Acquisition L.L.C. and New DBSD Satellite Services G.P. have received notice of our proposed action and have had an opportunity to protest. We direct the staff to send this Report and Order and Order of Proposed Modification by certified mail, return receipt requested to Gamma Acquisition L.L.C., and to New DBSD Satellite Services G.P. Pursuant to section 316(a)(1) of the Act and § 1.87(a) of the Commission's rules, receipt of this Report and Order and Order of Proposed Modification by certified mail, return receipt requested, shall constitute notification in writing of our Order of Proposed Modification proposing to modify the 2 GHz MSS licenses of Gamma Acquisition L.L.C. and New DBSD Satellite Services G.P. and of the grounds and reasons therefore. Gamma Acquisition L.L.C. and New DBSD Satellite Services G.P. shall have thirty days from the date of such receipt to protest such Order of Proposed Modification. To protest the proposed modifications, Gamma Acquisition L.L.C. or New DBSD Satellite Services G.P. must, within thirty days of receiving notice of this Report and Order and Order of Proposed Modification, submit a written statement with sufficient evidence to show that the modification would not be in the public interest. The protest must be filed in the Electronic Comment Filing System (ECFS) under WT Docket No. 12-70 or with the Office of the Secretary, Federal Communications Commission, 445 Twelfth Street, S.W., Room TW-A235, Washington, D.C. 20554; the protesting party must, within 30 days of receiving notice of this Report and Order and Order of Proposed Modification, send a copy of the protest

via electronic mail to Kevin Holmes of the Broadband Division of the Wireless Telecommunications Bureau at [Kevin.Holmes@fcc.gov](mailto:Kevin.Holmes@fcc.gov). (This address is proper only for protests submitted by U.S. mail. For hand-delivered or messenger-delivered paper filings, the proper address is 236 Massachusetts Ave., N.E., Suite 110, Washington, D.C. 20002. For documents sent by overnight delivery service other than United States Postal Service Express Mail and Priority Mail, the proper address is 9300 East Hampton Dr., Capitol Heights, MD 20743. For further information, contact the Office of the Secretary at (202) 418-0300 or [mdortch@fcc.gov](mailto:mdortch@fcc.gov)) Once the 30 day protest period has lapsed, Gamma Acquisition L.L.C.'s and New DBSD Satellite Services G.P.'s right to file a protest expires, and the Commission may modify the licenses as noticed. Finally, in the event that Gamma Acquisition L.L.C. or New DBSD Satellite Services G.P. rejects any aspect of the proposed license modification, it will be deemed to have rejected the entire license modification.

235. We delegate to the Wireless Telecommunications Bureau and the International Bureau the authority to issue a license modification order for Gamma Acquisition L.L.C. (call sign E060430) and for New DBSD Satellite Services G.P. (call sign E070272), but only to the extent consistent with paragraphs 319-320 above.

236. Ex Parte Status. Unless otherwise provided by the Commission or its staff pursuant to § 1.1200(a), a license modification proceeding under Title III of the Communications Act is treated as a restricted proceeding for ex parte purposes under § 1.1208 of the Commission's rules. In this case, the license modification proceedings are related to the above-captioned rulemaking proceeding, WT Docket No. 12-70, which is designated as a permit but disclose proceeding under the ex parte rules. Due to the interrelated nature of these proceedings, we find that it is in the public interest to treat the license modification proceedings as permit but disclose proceedings under § 1.1206 of the Commission's rules. Therefore, any ex parte presentations that are made with respect to the issues involved in the subject license modification proceedings subsequent to the release of the this Order of Proposed Modification will be permissible but must be disclosed in accordance with the requirements of § 1.1206(b) of the

Commission's rules. Persons making ex parte presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral ex parte presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the ex parte presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during ex parte meetings are deemed to be written ex parte presentations and must be filed consistent with rule § 1.1206(b). For administrative convenience only, any filings related to this Order of Proposed Modification must be filed in WT Docket No. 12-70 and may be filed using the Electronic Comment Filing System (ECFS), <http://apps.fcc.gov/ecfs/2d>. In proceedings governed by rule § 1.49(f) or for which the Commission has made available a method of electronic filing, written ex parte presentations and memoranda summarizing oral ex parte presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's ex parte rules.

## **VI. NOTICE OF INQUIRY: 2 GHZ EXTENSION BAND CONCEPT**

237. In the AWS-4 Notice of Inquiry, the Commission sought comment on a variation on the AWS-4 band plan proposed in the AWS-4 NPRM. That band plan, termed the "2 GHz Extension Band Concept," would have incorporated the NTIA proposal to reallocate the 1695-1710 MHz band from Federal to non-Federal use and would have resulted in a 35 megahertz band that paired 2180-2200 MHz

(downlink) with 1695-1710 MHz (uplink) and a 30 megahertz downlink expansion band of 1995-2025 MHz, 77 FR 22737, April 17, 2012. Because we adopt a specific AWS-4 band plan above that includes much of this spectrum, we decline at this time to pursue the 2 GHz Extension Band Concept.

## **VII. PROCEDURAL MATTERS**

### **A. Paperwork Reduction Act Analysis**

238. This document contains modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. 3506(c)(4), we previously sought specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees.

239. In this present document, we have assessed the effects of the policies adopted in this Report and Order and Order of Proposed Modification with regard to information collection burdens on small business concerns, and find that these policies will benefit many companies with fewer than 25 employees because the revisions we adopt should provide small entities with more information, more flexibility, and more options for gaining access to valuable wireless spectrum. In addition, we have described impacts that might affect small businesses, which includes most businesses with fewer than 25 employees, in the Final Regulatory Flexibility Analysis (FRFA).

### **B. Final Regulatory Flexibility Analysis**

240. The Regulatory Flexibility Act (RFA) requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that “the rule will not,



if promulgated, have a significant economic impact on a substantial number of small entities.”

Accordingly, we have prepared a FRFA concerning the possible impact of the rule changes contained in the Report and Order on small entities.

### **C. Need for, and Objectives of, the Report and Order**

241. Demand for wireless broadband services and the network capacity associated with those services is surging, resulting in a growing demand for spectrum to support these services. Adoption of smartphones increased at a 50 percent annual growth rate in 2011, from 27 percent of U.S. mobile subscribers in December 2010 to nearly 42 percent in December 2011. Further, consumers have rapidly adopted the use of tablets, which were first introduced in January of 2010. By the end of 2012, it is estimated that one in five Americans—almost 70 million people—will use a tablet. Between 2011 and 2017, mobile data traffic generated by tablets is expected to grow at a compound annual growth rate of 100 percent. New mobile applications and services, such as high resolution video communications, are also using more bandwidth. For example, a single smartphone can generate as much traffic as thirty-five basic-feature mobile phones, while tablets connected to 3G and 4G networks use three times more data than smartphones over the cellular network. All of these trends, in combination, are creating an urgent need for more network capacity and, in turn, for suitable spectrum.

242. The 2010 National Broadband Plan recommended the Commission undertake to make 500 megahertz of spectrum available for broadband use within ten years, including 300 megahertz within five years. The Commission has taken numerous steps to achieve these goals, including recently adopting a notice of proposed rulemaking on conducting the world’s first incentive auction to repurpose broadcast spectrum for wireless broadband use, and updating the Commission’s rules for the 2.3 GHz Wireless Communications Service (WCS) band to permit the use of the most advanced wireless technologies in that band.

243. In February 2012, Congress enacted Title VI of the Middle Class Tax Relief and Job Creation Act of 2012 (the “Spectrum Act”). The Spectrum Act includes several provisions to make more spectrum available for commercial use, including through auctions, and to improve public safety communications. Among other things, the Spectrum Act requires the Commission, by February 23, 2015, to allocate the 1915-1920 MHz band and the 1995-2000 MHz band (collectively, the H Block) for commercial use, and to auction and grant new initial licenses for the use of each spectrum band, subject to flexible-use service rules. Congress provided, however, that if the Commission determined that either of the bands could not be used without causing harmful interference to commercial licensees in 1930-1995 MHz (PCS downlink), then the Commission was prohibited from allocating that specific band for commercial use or licensing it. Additionally, sections 6401(f) and 6413 of the Spectrum Act specify that the proceeds from an auction of licenses in the 1995-2000 MHz band and in the 1915-1920 MHz band shall be deposited in the Public Safety Trust Fund and then used to fund the Nationwide Public Safety Broadband Network (“FirstNet”). The H block spectrum could be the first spectrum specified by the Spectrum Act to be licensed by auction, and thus could represent the first inflow of revenues toward this statutory goal.

244. In this Report and Order, we increase the Nation’s supply of spectrum for mobile broadband by adopting flexible use rules for 40 megahertz of spectrum in the 2 GHz band (2000-2020 MHz and 2180-2200 MHz), which we term the AWS-4 band. In so doing, we carry out a recommendation in the National Broadband Plan that the Commission enable the provision of stand-alone terrestrial services in the 2 GHz Mobile Satellite Service (MSS) spectrum band, thus dramatically increasing the value of this spectrum to the public. Specifically, we remove regulatory barriers to mobile broadband use of this spectrum, and adopt service, technical, and licensing rules that will encourage innovation and investment in mobile broadband and provide certainty and a stable regulatory regime in which broadband deployment can rapidly occur.

**D. Legal Basis**

245. The actions are authorized pursuant to sections 1, 2, 4(i), 201, 301, 302, 303, 307, 308, 309, 310, 316, 319, 324, 332, and 333 of the Communications Act of 1934, as amended, 47 U.S.C. 151, 152, 154(i), 201, 301, 302, 303, 307, 308, 309, 310, 316, 319, 324, 332, and 333, and Section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. 1302.

**E. Description and Estimate of the Number of Small Entities To Which the Rules Will Apply**

246. The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the rules adopted, herein. The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.” In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act. A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA. Below, we describe and estimate the number of small entity licensees that may be affected by the adopted rules.

247. Small Businesses, Small Organizations, and Small Governmental Jurisdictions. Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards that encompass entities that could be directly affected by the proposals under consideration. As of 2009, small businesses represented 99.9% of the 27.5 million businesses in the United States, according to the SBA. Additionally, a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.” Nationwide, as of 2007, there were approximately 1,621,315 small organizations. Finally, the term “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a

population of less than fifty thousand.” Census Bureau data for 2007 indicate that there were 89,527 governmental jurisdictions in the United States. We estimate that, of this total, as many as 88,761 entities may qualify as “small governmental jurisdictions.” Thus, we estimate that most governmental jurisdictions are small.

248. Satellite Telecommunications and All Other Telecommunications. The rules adopted in this Order would affect some providers of satellite telecommunications services. Satellite telecommunications service providers include satellite and earth station operators. Since 2007, the SBA has recognized two census categories for satellite telecommunications firms: “Satellite Telecommunications” and “Other Telecommunications.” Under the “Satellite Telecommunications” category, a business is considered small if it had \$15 million or less in average annual receipts. Under the “Other Telecommunications” category, a business is considered small if it had \$25 million or less in average annual receipts.

249. The first category of Satellite Telecommunications “comprises establishments primarily engaged in providing point-to-point telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.” For this category, Census Bureau data for 2007 show that there were a total of 512 satellite communications firms that operated for the entire year. Of this total, 464 firms had annual receipts of under \$10 million, and 18 firms had receipts of \$10 million to \$24,999,999.

250. The second category of Other Telecommunications is comprised of entities “primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from,

satellite systems. Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.” For this category, Census Bureau data for 2007 show that there were a total of 2,383 firms that operated for the entire year. Of this total, 2,346 firms had annual receipts of under \$25 million. Consequently, the Commission estimates that the majority of All Other Telecommunications firms are small entities that might be affected by our actions.

251. Satellite Telecommunications/Mobile Satellite Service Licensees. Neither the Commission nor the U.S. Small Business Administration has developed a small business size standard specifically for mobile satellite service licensees. The appropriate size standard is therefore the SBA standard for Satellite Telecommunications, which provides that such entities are small if they have \$15 million or less in annual revenues. This industry comprises establishments primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications. Currently, the Commission’s records show that there are 31 entities authorized to provide voice and data MSS in the United States. The Commission does not have sufficient information to determine which, if any, of these parties are small entities. The Commission notes that small businesses are not likely to have the financial ability to become MSS system operators because of high implementation costs, including construction of satellite space stations and rocket launch, associated with satellite systems and services.

252. However, the U.S. Census publishes data about Satellite Telecommunications generally, and this data may well be relevant to the estimate of the number of voice and data MSS. Census data for 2007 indicate that 512 satellite telecommunications firms operated during that year. Of that 512, 290 received annual receipts of \$10.0 million or less. 18 firms received annual receipts of between \$10.0 million and \$24, 999.999 and 30 received annual receipts of \$25.0 million or more. Since the Census data does not distinguish between MSS and other types of satellite communications companies, it cannot be

known precisely, based on Census data, how many of the 31 authorized MSS firms are small. However, since the majority of all satellite telecommunications companies were small under the applicable standard, a limited inference is possible that some of the 31 MSS firms are small. Since it is possible that some MSS companies are small entities affected by this Order, we therefore include them in this section of the FRFA.

253. Wireless Telecommunications Carriers (except satellite). The Report and Order applies various Commission policies and rules to terrestrial service in the MSS bands. We cannot predict who may in the future become a licensee or lease spectrum for terrestrial use in these bands. In general, any wireless telecommunications provider would be eligible to become an Advanced Wireless Service licensee or lease spectrum from the MSS or AWS licensees. This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular phone services, paging services, wireless Internet access, and wireless video services.

254. The appropriate size standard under SBA rules is for the category Wired Telecommunications Carriers. Under that size standard, such a business is small if it has 1,500 or fewer employees. Census Bureau data for 2007, which now supersede data from the 2002 Census, show that there were 3,188 firms in this category that operated for the entire year. Of this total, 3,144 had employment of 999 or fewer, and 44 firms had employment of 1,000 employees or more. Thus under this category and the associated small business size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities that may be affected by our actions.

**F. Description of Projected Reporting, Recordkeeping, and other Compliance Requirements**

255. The projected reporting, recordkeeping, and other compliance requirements resulting from the Report and Order will apply to all entities in the same manner. The Commission believes that applying the same rules equally to all entities in this context promotes fairness. The Commission does not believe that the costs and/or administrative burdens associated with the rules will unduly burden small entities. The revisions the Commission adopts should benefit small entities by giving them more information, more flexibility, and more options for gaining access to valuable wireless spectrum.

256. Any applicants for licenses of AWS-4 operating authority will be required to file license applications using the Commission's automated Universal Licensing System (ULS). ULS is an online electronic filing system that also serves as a powerful information tool that enables potential licensees to research applications, licenses, and antennae structures. It also keeps the public informed with weekly public notices, FCC rulemakings, processing utilities, and a telecommunications glossary. Licensees of AWS-4 operating authority that must submit long-form license applications must do so through ULS using Form 601, FCC Ownership Disclosure Information for the Wireless Telecommunications Services using FCC Form 602, and other appropriate forms.

**G. Steps taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered**

257. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.

258. As we provide in this Report and Order, licensing the AWS-4 bands under Economic Areas (EA) geographic size licenses will provide regulatory parity with other AWS bands that are licensed on an EA basis, such as AWS-1 B and C block licenses. Additionally, assigning AWS-4 in EA geographic areas will allow AWS-4 licensees to make adjustments to suit their individual needs. EA license areas are small enough to provide spectrum access opportunities for smaller carriers. EA license areas also nest within and may be aggregated up to larger license areas that have been used by the Commission for other services, such as Major Economic Areas (MEAs) and Regional Economic Area Groupings (REAGs) for those seeking to create larger service areas. Licensees may also adjust their geographic coverage through secondary markets. These rules should enable licensees of AWS-4 operating authority, or any entities, whether large or small, providing service in other AWS bands to more easily adjust their spectrum to build their networks pursuant to individual business plans.

259. This Report and Order adopts rules to protect entities operating in nearby spectrum bands from harmful interference, which may include small entities. The technical rules adopted in the Report and Order are designed, among other things, to protect broadband PCS services operating in the 1930-1995 MHz band, future services operating in the 1995-2000 MHz band, and Federal operations in the 2200-2290 MHz band from harmful interference from AWS-4 operations.

260. The Report and Order provides licensees of AWS-4 authority with the flexibility to provide any fixed or mobile service that is consistent with the allocations for this spectrum, which is consistent with other spectrum allocated or designated for licensed fixed and mobile services, e.g., AWS-1. The Report and Order further provides for licensing of this spectrum under the Commission's market-oriented part 27 rules. This includes applying the Commission's secondary market policies and rules to all transactions involving the use of AWS-4 bands for terrestrial services, which will provide greater predictability and regulatory parity with bands licensed for terrestrial mobile broadband service. These rules should make it easier for AWS-4 providers to enter secondary market arrangements involving terrestrial use of their spectrum. The secondary market rules apply equally to all entities, whether small



or large. As a result, we believe that this will provide an economic benefit to small entities by making it easier for entities, whether large or small, to enter into secondary market arrangements for AWS-4 spectrum.

#### **H. Federal Rules that May Duplicate, Overlap, or Conflict with the Rules**

261. None.

### **VIII. ORDERING CLAUSES**

262. Accordingly, it is ordered, pursuant to sections 1, 2, 4(i), 201, 301, 302, 303, 307, 308, 309, 310, 316, 319, 324, 332 and 333 of the Communications Act of 1934, as amended, 47 U.S.C. 151, 152, 154(i), 201, 301, 302, 303, 307, 308, 309, 310, 316, 319, 324, 332, and 333 that this Report and Order and Order of Proposed Modification is hereby adopted.

263. It is further ordered that parts 1, 2, 25, 27, and 101 of the Commission's rules, 47 CFR 1, 2, 25, 27, and 101, are amended,, effective 30 days after publication in the Federal Register except as otherwise provided herein.

264. It is further ordered that the amendments, adopted above, to §§ 1.949, 27.14, 27.17, 27.1131, 27.1134, 27.1136, 27.1166, 27.1168, 21.1170, 101.69, and 101.73(d) of the Commission's rules, 47 CFR 1.949, 27.14, 27.17, 27.1131, 27.1134, 27.1136, 27.1166, 27.1168, 21.1170, 101.69, and 101.73(d), which contain new or modified information collection requirements that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act (PRA), will become effective after the Commission publishes a notice in the Federal Register announcing such approval and the relevant effective date.

265. It is further proposed, pursuant to sections 4(i) and 316(a) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 316, and § 1.87 of the Commission's rules, 47 CFR 1.87, that the license for Call Sign E060430 held by Gamma Acquisition L.L.C. be modified consistent with section IV

(Order of Proposed Modification) of this Report and Order and Order of Proposed Modification. Pursuant to section 316(a)(1) of the Communications Act of 1934, as amended, 47 U.S.C. 316(a)(1), and § 1.87(a) of the Commission's rules, 47 CFR 1.87(a), receipt of this Report and Order and Order of Proposed Modification by certified mail, return receipt requested, shall constitute notification in writing of our Order of Proposed Modification that proposes to modify Call Sign E060430 held by Gamma Acquisition L.L.C., and of the grounds and reasons therefore, and Gamma Acquisition L.L.C. shall have thirty (30) days from the date of receipt to protest such Order of Proposed Modification. The Wireless Telecommunications Bureau and the International Bureau are delegated authority to issue an order of modification if no protests are filed.

266. It is further proposed, pursuant to sections 4(i) and 316(a) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 316, and § 1.87 of the Commission's rules, 47 CFR 1.87, that the license for Call Sign E070272 held by New DBSD Satellite Services G.P. be modified consistent with section IV (Order of Proposed Modification) of this Report and Order and Order of Proposed Modification. Pursuant to section 316(a)(1) of the Communications Act of 1934, as amended, 47 U.S.C. 316(a)(1), and § 1.87(a) of the Commission's rules, 47 CFR 1.87(a), receipt of this Report and Order and Order of Proposed Modification by certified mail, return receipt requested, shall constitute notification in writing of our Order of Proposed Modification that proposes to modify Call Sign E070272 held by New DBSD Satellite Services G.P., and of the grounds and reasons therefore, and New DBSD Satellite Services G.P. shall have thirty (30) days from the date of receipt to protest such Order of Proposed Modification. The Wireless Telecommunications Bureau and the International Bureau are delegated authority to issue an order of modification if no protests are filed.

267. It is further ordered that this Report and Order and Order of Proposed Modification shall be sent by certified mail, return receipt request, to Gamma Acquisition L.L.C., 9601 South Meridian Blvd., Englewood, CO 80112 and Pantelis Michalopoulos, Steptoe & Johnson LLP, 1330 Connecticut Avenue, NW, Washington, DC 20036-1795, and to New DBSD Satellite Services G.P., 11700 Plaza

America Drive, Suite 1010, Reston VA 20190 and Pantelis Michalopoulos, Steptoe & Johnson LLP, 1330 Connecticut Avenue, NW, Washington, DC 20036-1795.

268. It is further ordered that the license modification proceedings commenced by the Order of Proposed Modification shall be treated as permit-but-disclose proceedings under the Commission's ex parte rules, see 47 CFR 1.1200 et seq.

269. It is further ordered that the Wireless Telecommunications Bureau is delegated authority to make all necessary changes to its electronic database systems and forms to implement the policies and rules adopted in this Report and Order.

270. It is further ordered that the International Bureau is delegated authority to act on the petition for reconsideration filed by Inmarsat in IB Docket Nos. 05-220 and 05-221, consistent with this Order as set forth above.

271. It is further ordered that the Final Regulatory Flexibility Analysis hereto is adopted.

272. It is further ordered that the Commission shall send a copy of this Report and Order to Congress and the Government Accountability Office pursuant to the Congressional Review Act, see 5 U.S.C. 801(a)(1)(A).

273. It is further ordered that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, shall send a copy of this Report and Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

**List of Subjects**

**47 CFR Parts 1, 2, and 101**

Radio, Reporting and recordkeeping requirements.

**47 CFR Parts 25 and 27**

Communications common carriers, Radio.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch,  
Secretary.

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 1, 2, 25, 27, and 101 as follows:

## **PART 1— PRACTICE AND PROCEDURE**

1. The authority citation for part 1 continues to read as follows:

Authority: 15 U.S.C. 79 et seq.; 47 U.S.C. 151, 154(i), 154(j), 155, 157, 225, 227, 303(r), and 309.

2. Amend § 1.949 by adding paragraph (c) to read as follows:

### **§ 1.949 Application for renewal of license.**

\*\*\*\*\*

(c) Renewal showing. An applicant for renewal of a geographic-area authorization in the 2000-2020 MHz and 2180-2200 MHz service bands must make a renewal showing, independent of its performance requirements, as a condition of renewal. The showing must include a detailed description of the applicant's provision of service during the entire license period and address:

- (1) The level and quality of service provided by the applicant (e.g., the population served, the area served, the number of subscribers, the services offered);
- (2) The date service commenced, whether service was ever interrupted, and the duration of any interruption or outage;
- (3) The extent to which service is provided to rural areas;
- (4) The extent to which service is provided to qualifying tribal land as defined in § 1.2110(f)(3)(i); and
- (5) Any other factors associated with the level of service to the public.

## **PART 2— FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS**

3. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

4. Section 2.106, the Table of Frequency Allocations, is revised as follows:

- a. Page 36 is revised

- b. In the list of non-Federal Government (NG) Footnotes, footnote NG43 is removed.

The revision reads as follows:

**§ 2.106 Table of Frequency Allocations.**

\*\*\*\*\*

1980-2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A  5.388 5.389A 5.389B 5.389F			1980-2025	NG177	Satellite Communications (25) Wireless Communications (27)
2010-2025 FIXED MOBILE 5.388A 5.388B		2000-2020 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)			
5.388		2020-2025 FIXED MOBILE  NG177			
2010-2025 FIXED MOBILE-SATELLITE (Earth-to-space)			2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space)  5.392	2025-2110 FIXED NG118 MOBILE 5.391	TV Auxiliary Broadcasting (74F) Cable TV Relay (78) Local TV Transmission (101J)
5.388 5.389C 5.389E		5.392 US90 US222 US346 US347 US393			
5.388		5.391 5.392 US90 US222 US346 US347 US393			
2110-2120 FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space)			2110-2120	2110-2120 FIXED MOBILE	Public Mobile (22) Wireless Communications (27) Fixed Microwave (101)
5.388			US252	US252	
2120-2170 FIXED MOBILE 5.388A 5.388B		2120-2170 FIXED MOBILE 5.388A 5.388B	2120-2200	2120-2180 FIXED MOBILE	
2120-2160 FIXED MOBILE 5.388A 5.388B Mobile-satellite (space-to-Earth)		5.388		NG153 NG178	Satellite Communications (25) Wireless Communications (27)
5.388				2180-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)	
2160-2170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)					
5.388 5.389C 5.389E			2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A  5.388 5.389A 5.389F		
5.388					
5.388					

Page 36

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## **PART 25— SATELLITE COMMUNICATIONS**

5. The authority citation for part 25 continues to read as follows:

Authority: 47 U.S.C. 701-744. Interprets or applies sections 4, 301, 302, 303, 307, 309 and 332 of the Communications Act, as amended, 47 U.S.C. 154, 301, 302, 303, 307, 309 and 332, unless otherwise noted.

6. Amend § 25.143 by revising paragraphs (i) and (k) to read as follows:

**§ 25.143 Licensing provisions for the 1.6/2.4 GHz mobile-satellite service and 2 GHz mobile-satellite service.**

\*\*\*\*\*

(i) Incorporation of ancillary terrestrial component base stations into a 1.6/2.4 GHz mobile-satellite service network. Any licensee authorized to construct and launch a 1.6/2.4 GHz system may construct ancillary terrestrial component (ATC) base stations as defined in § 25.201 at its own risk and subject to the conditions specified in this subpart any time after commencing construction of the mobile-satellite service system.

\*\*\*\*\*

(k) Aircraft. ATC mobile terminals must be operated in accordance with 25.136(a). All portable or hand-held transceiver units (including transceiver units installed in other devices that are themselves portable or hand-held) having operating capabilities in the 1610–1626.5 MHz/2483.5–2500 MHz bands shall bear the following statement in a conspicuous location on the device: “This device may not be operated while on board aircraft. It must be turned off at all times while on board aircraft.”

7. Amend § 25.149 by revising the section heading and paragraph (a)(1) introductory text, removing and reserving paragraphs (a)(2)(i), (b)(1)(i), and (b)(5)(i), and revising paragraphs (d) and (e) to read as follows:

**§ 25.149 Application requirements for ancillary terrestrial components in the mobile-satellites service networks operating in the 1.5/1.6 GHz and 1.6/2.4 GHz mobile-satellite service.**



(a) \*\*\*

(1) ATC shall be deployed in the forward-band mode of operation whereby the ATC mobile terminals transmit in the MSS uplink bands and the ATC base stations transmit in the MSS downlink bands in portions of the 1626.5–1660.5 MHz/1525–1559 MHz bands (L-band) and the 1610–1626.5 MHz/2483.5–2500 MHz bands (Big LEO band).

\*\*\*\*\*

(d) Applicants for an ancillary terrestrial component authority shall demonstrate that the applicant does or will comply with the provisions of § 1.924 of this chapter and §§ 25.203(e) through 25.203(g) and with § 25.253 or § 25.254, as appropriate, through certification or explanatory technical exhibit.

(e) Except as provided for in paragraph (f) of this section, no application for an ancillary terrestrial component shall be granted until the applicant has demonstrated actual compliance with the provisions of paragraph (b) of this section. Upon receipt of ATC authority, all ATC licensees must ensure continued compliance with this section and §§ 25.253 or 25.254, as appropriate.

\*\*\*\*\*

**§25.252 [Removed and Reserved].**

8. Remove and reserve § 25.252.

9. Amend § 25.255 by revising the section heading to read as follows:

**§ 25.255 Procedures for resolving harmful interference related to operation of ancillary terrestrial components operating in the 1.5/1.6 GHz and 1.6/2.4 GHz bands.**

\*\*\*\*\*

10. Add § 25.265 to read as follows:

**§ 25.265 Acceptance of interference in 2000-2020 MHz.**

(a) MSS receivers operating in the 2000-2020 MHz band must accept interference from lawful operations in the 1995-2000 MHz band, where such interference is due to:

(1) The in-band power of any operations in 1995-2000 MHz (i.e., the portion of transmit power contained in the 1995-2000 MHz band); or

(2) The portion of out-of-band emissions contained in 2000-2005 MHz.

(b) [Reserved].

## **PART 27—MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES**

11. The authority citation for part 27 continues to read as follows:

Authority: 47 U.S.C. 154, 301, 302, 303, 307, 309, 332, 336, and 337 unless otherwise noted.

12. Amend § 27.1 by adding paragraph (b)(10) to read as follows:

### **§ 27.1 Basis and purpose.**

\*\*\*\*\*

(b) \*\*\*

(10) 2000-2020 MHz and 2180-2200 MHz.

\*\*\*\*\*

13. Amend § 27.2 by revising paragraph (a) and adding paragraph (d) to read as follows:

### **§ 27.2 Permissible communications.**

(a) Miscellaneous wireless communications services. Except as provided in paragraph (b) or (d) of this section and subject to technical and other rules contained in this part, a licensee in the frequency bands specified in § 27.5 may provide any services for which its frequency bands are allocated, as set forth in the non-Federal Government column of the Table of Allocations in § 2.106 of this chapter (column 5).

\*\*\*\*\*

(d) 2000-2020 MHz and 2180-2200 MHz bands. Operators in the 2000-2020 MHz and 2180-2200 MHz bands may not provide the mobile-satellite service under the provisions of this part; rather, mobile-satellite service shall be provided in a manner consistent with part 25 of this chapter.

14. Amend § 27.4 by revising the definition in “Advanced wireless service (AWS)” to read as follows:

### **§ 27.4 Terms and definitions.**

Advanced Wireless Service (AWS). A radiocommunication service licensed pursuant to this part for the frequency bands specified in § 27.5(h) or § 27.5(j).

\*\*\*\*\*

15. Amend § 27.5 by adding paragraph (j) to read as follows:

**§ 27.5 Frequencies.**

\*\*\*\*\*

(j) 2000-2020 MHz and 2180-2200 MHz bands. The following frequencies are available for licensing pursuant to this part in the 2000-2020 MHz and 2180-2200 MHz (AWS-4) bands:

(1) Two paired channel blocks of 10 megahertz each are available for assignment as follows:

Block A: 2000-2010 MHz and 2180-2190 MHz; and

Block B: 2010-2020 MHz and 2190-2200 MHz.

(2) [Reserved].

16. Amend § 27.6 by adding paragraph (i) to read as follows:

**§ 27.6 Service areas.**

\*\*\*\*\*

(i) 2000-2020 MHz and 2180-2200 MHz bands. AWS service areas for the 2000-2020 MHz and 2180-2200 MHz bands are based on Economic Areas (EAs) as defined in paragraph (a) of this section.

17. Amend § 27.13 by adding paragraph (i) to read as follows:

**§ 27.13 License period.**

\*\*\*\*\*

(i) 2000-2020 MHz and 2180-2200 MHz bands. Authorizations for the 2000-2020 MHz and 2180-2200 MHz bands will have a term not to exceed ten years from the date of issuance or renewal.

18. Amend § 27.14 by revising the first sentence of paragraphs (a), (f), and (k), and adding paragraph (q) to read as follows:

**§ 27.14 Construction requirements; Criteria for renewal.**

(a) AWS and WCS licensees, with the exception of WCS licensees holding authorizations for Block A in the 698–704 MHz and 728–734 MHz bands, Block B in the 704–710 MHz and 734–740 MHz bands, Block E in the 722–728 MHz band, Block C, C1, or C2 in the 746–757 MHz and 776–787 MHz bands, Block D in the 758–763 MHz and 788–793 MHz bands, Block A in the 2305–2310 MHz and 2350–2355 MHz bands, Block B in the 2310–2315 MHz and 2355–2360 MHz bands, Block C in the 2315–2320 MHz band, and Block D in the 2345–2350 MHz band, and with the exception of licensees holding AWS authorizations in the 2000-2020 MHz and 2180-2200 MHz bands, must, as a performance requirement, make a showing of “substantial service” in their license area within the prescribed license term set forth in § 27.13. \*\*\*

\*\*\*\*\*

(f) Comparative renewal proceedings do not apply to WCS licensees holding authorizations for the 698–746 MHz, 747–762 MHz, and 777–792 MHz bands and licensees holding AWS authorizations for the 2000-2020 MHz and 2180-2200 MHz bands. \*\*\*

\* \* \* \* \*

(k) Licensees holding WCS or AWS authorizations in the spectrum blocks enumerated in paragraphs (g), (h), (i), or (q) of this section, including any licensee that obtained its license pursuant to the procedures set forth in paragraph (j) of this section, shall demonstrate compliance with performance requirements by filing a construction notification with the Commission, within 15 days of the expiration of the applicable benchmark, in accordance with the provisions set forth in § 1.946(d) of this chapter. \*\*\*

\* \* \* \* \*

(q) The following provisions apply to any licensee holding an AWS authorization in the 2000-2020 MHz and 2180-2200 MHz bands (an “AWS-4 licensee”):

(1) An AWS-4 licensee shall provide terrestrial signal coverage and offer terrestrial service within four (4) years from the date of the license to at least forty (40) percent of the total population in the aggregate service areas that it has licensed in the 2000-2020 MHz and 2180-2200 MHz bands (“AWS-4 Interim Buildout Requirement”). For purposes of this subpart, a licensee’s total population shall be calculated by

summing the population of each license area that a licensee holds in the 2000-2020 MHz and 2180-2200 MHz bands; and

(2) An AWS-4 licensee shall provide terrestrial signal coverage and offer terrestrial service within seven

(7) years from the date of the license to at least to at least seventy (70) percent of the population in each of its license areas in the 2000-2020 MHz and 2180-2200 MHz bands (“AWS-4 Final Buildout Requirement”).

(3) If any AWS-4 licensee fails to establish that it meets the AWS-4 Interim Buildout Requirement, the AWS-4 Final Buildout requirement shall be accelerated by one year from (seven to six years).

(4) If any AWS-4 licensee fails to establish that it meets the AWS-4 Final Buildout Requirement in any of its license areas in the 2000-2020 MHz and 2180-2200 MHz bands, its authorization for each license area in which it fails to meet the requirement shall terminate automatically without Commission action. To the extent that the AWS-4 licensee also holds the 2 GHz MSS rights for the affected license area, failure to meet the AWS-4 Final Buildout Requirement in an EA shall also result in the MSS protection rule in § 27.1136 no longer applying in that license area.

(5) To demonstrate compliance with these performance requirements, licensees shall use the most recently available U.S. Census Data at the time of measurement and shall base their measurements of population served on areas no larger than the Census Tract level. The population within a specific Census Tract (or other acceptable identifier) will only be deemed served by the licensee if it provides signal coverage to and offers service within the specific Census Tract (or other acceptable identifier). To the extent the Census Tract (or other acceptable identifier) extends beyond the boundaries of a license area, a licensee with authorizations for such areas may only include the population within the Census Tract (or other acceptable identifier) towards meeting the performance requirement of a single, individual license.

(6) Failure by any AWS-4 licensee to meet the AWS-4 Final Buildout Requirement in paragraph (q)(4) of this section will result in forfeiture of the license and the licensee will be ineligible to regain it.

19. Amend § 27.15 by revising paragraph (d)(1)(i); adding paragraph (d)(1)(iii); revising paragraph (d)(2)(i); and adding paragraph (d)(2)(iii) to read as follows:

**§ 27.15 Geographic partitioning and spectrum disaggregation.**

\*\*\*\*\*

(d) \*\*\*

(1) \*\*\*

(i) Except for WCS licensees holding authorizations for Block A in the 698–704 MHz and 728–734 MHz bands, Block B in the 704–710 MHz and 734–740 MHz bands, Block E in the 722–728 MHz band, Blocks C, C1, or C2 in the 746–757 MHz and 776–787 MHz bands, or Block D in the 758–763 MHz and 788–793 MHz bands; and for licensees holding AWS authorizations in the 2000-2020 MHz and 2180-2200 MHz bands; the following rules apply to WCS and AWS licensees holding authorizations for purposes of implementing the construction requirements set forth in § 27.14. Parties to partitioning agreements have two options for satisfying the construction requirements set forth in § 27.14. Under the first option, the partitioner and partitionee each certifies that it will independently satisfy the substantial service requirement for its respective partitioned area. If a licensee subsequently fails to meet its substantial service requirement, its license will be subject to automatic cancellation without further Commission action. Under the second option, the partitioner certifies that it has met or will meet the substantial service requirement for the entire, pre-partitioned geographic service area. If the partitioner subsequently fails to meet its substantial service requirement, only its license will be subject to automatic cancellation without further Commission action.

\*\*\*\*\*

(iii) For licensees holding AWS authorizations in the 2000-2020 MHz and 2180-2200 MHz bands, the following rules apply for purposes of implementing the construction requirements set forth in § 27.14. Each party to a geographic partitioning must individually meet any service-specific performance requirements (i.e., construction and operation requirements). If a partitioner or partitionee fails to meet

any service-specific performance requirements on or before the required date, then the consequences for this failure shall be those enumerated in § 27.14(q)

(2) \*\*\*

(i) Except for WCS licensees holding authorizations for Block A in the 698–704 MHz and 728–734 MHz bands, Block B in the 704–710 MHz and 734–740 MHz bands, Block E in the 722–728 MHz band, Blocks C, C1, or C2 in the 746–757 MHz and 776–787 MHz bands, or Block D in the 758–763 MHz and 788–793 MHz bands; and for licensees holding AWS authorizations in the 2000-2020 MHz and 2180-2200 MHz bands; the following rules apply to WCS and AWS licensees holding authorizations for purposes of implementing the construction requirements set forth in § 27.14. Parties to disaggregation agreements have two options for satisfying the construction requirements set forth in § 27.14. Under the first option, the disaggregator and disaggregatee each certifies that it will share responsibility for meeting the substantial service requirement for the geographic service area. If the parties choose this option and either party subsequently fails to satisfy its substantial service responsibility, both parties' licenses will be subject to forfeiture without further Commission action. Under the second option, both parties certify either that the disaggregator or the disaggregatee will meet the substantial service requirement for the geographic service area. If the parties choose this option, and the party responsible subsequently fails to meet the substantial service requirement, only that party's license will be subject to forfeiture without further Commission action.

\*\*\*\*\*

(iii) For licensees holding AWS authorizations in the 2000-2020 MHz and 2180-2200 MHz bands, the following rules apply for purposes of implementing the construction requirements set forth in § 27.14. Each party to a spectrum disaggregation must individually meet any service-specific performance requirements (i.e., construction and operation requirements). If a disaggregator or a disaggregatee fails to meet any service-specific performance requirements on or before the required date, then the consequences for this failure shall be those enumerated in § 27.14(q).

20. Add § 27.17 to read as follows:

**§ 27.17 Discontinuance of service in the 2000-2020 MHz and 2180-2200 MHz bands.**

(a) Termination of authorization. A licensee's AWS authorization in the 2000-2020 MHz and 2180-2200 MHz bands will automatically terminate, without specific Commission action, if it permanently discontinues service after meeting the AWS-4 Final Buildout Requirement as specified in § 27.14.

(b) Permanent discontinuance. Permanent discontinuance of service is defined as 180 consecutive days during which a licensee holding AWS authority in the 2000-2020 MHz and 2180-2200 MHz bands does not operate or, in the case of a commercial mobile radio service provider, does not provide service to at least one subscriber that is not affiliated with, controlled by, or related to the providing carrier.

(c) Filing requirements. A licensee of the 2000-2020 MHz and 2180-2200 MHz bands that permanently discontinues service as defined in this section must notify the Commission of the discontinuance within 10 days by filing FCC Form 601 or 605 requesting license cancellation. An authorization will automatically terminate, without specific Commission action, if service is permanently discontinued as defined in this section, even if a licensee fails to file the required form requesting license cancellation.

21. Amend § 27.50 by revising paragraphs (d) introductory text, (d)(1) introductory text, and (d)(2) introductory text, and adding paragraphs (d)(7) and (8) to read as follows:

**§ 27.50 Power limits and duty cycle.**

\*\*\*\*\*

(d) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz, 2110–2155 MHz, 2000-2020 MHz, and 2180-2200 MHz bands:

(1) The power of each fixed or base station transmitting in the 2110–2155 MHz or 2180-2200 MHz bands and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to:

\*\*\*\*\*

(2) The power of each fixed or base station transmitting in the 2110–2155 MHz or 2180-2200 MHz bands and situated in any geographic location other than that described in paragraph (d)(1) of this section is limited to:



\*\*\*\*\*

(7) Fixed, mobile, and portable (hand-held) stations operating in the 2000-2020 MHz band are limited to 2 watts EIRP, except that the total power of any portion of an emission that falls within the 2000-2005 MHz band may not exceed 5 milliwatts. A licensee of AWS-4 authority may enter into private operator-to-operator agreements with all 1995-2000 MHz licensees to operate in 2000-2005 MHz at power levels above 5 milliwatts EIRP; except the total power of the AWS-4 mobile emissions may not exceed 2 watts EIRP.

(8) A licensee operating a base or fixed station in the 2180–2200 MHz band utilizing a power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must be coordinated in advance with all AWS licensees authorized to operate on adjacent frequency blocks in the 2180–2200 MHz band.

\*\*\*\*\*

22. Amend § 27.53 by revising paragraph (h) to read as follows:

**§ 27.53 Emission limits.**

\*\*\*\*\*

(h) AWS emission limits. (1) General protection levels. Except as otherwise specified below, for operations in the 1710–1755 MHz, 2110–2155 MHz, 2000-2020 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

(2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:

(i) Operations in the 2180-2200 MHz band are subject to the out-of-band emission requirements set forth in § 27.1134 for the protection of federal government operations operating in the 2200-2290 MHz band.

(ii) For operations in the 2000-2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least  $70 + 10 \log_{10}(P)$  dB.

(3) Measurement procedure. (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution

bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(ii) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(iii) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

(4) Private agreements. (i) For AWS operations in the 2000-2020 MHz and 2180-2200 MHz bands, to the extent a licensee establishes unified operations across the AWS blocks, that licensee may choose not to observe the emission limit specified in paragraph (h)(1), above, strictly between its adjacent block licenses in a geographic area, so long as it complies with other Commission rules and is not adversely affecting the operations of other parties by virtue of exceeding the emission limit.

(ii) For AWS operations in the 2000-2020 MHz band, a licensee may enter into private agreements with all licensees operating between 1995 and 2000 MHz to allow the  $70 + 10 \log_{10}(P)$  dB limit to be exceeded within the 1995-2000 MHz band.

(iii) An AWS licensee who is a party to a private agreement described in this section (4) must maintain a copy of the agreement in its station files and disclose it, upon request, to prospective AWS assignees, transferees, or spectrum lessees and to the Commission.

\*\*\*\*\*

23. Amend § 27.55 by revising paragraph (a)(1) to read as follows:

**§ 27.55 Power strength limits.**

(a)\*\*\*

(1) 2110–2155, 2180-2200, 2305–2320 and 2345–2360 MHz bands: 47 dBμV/m.

\*\*\*\*\*

24. Amend § 27.57 by revising paragraph (c) to read as follows:

**§ 27.57 International coordination.**

\*\*\*\*\*

(c) Operation in the 1710-1755 MHz, 2110-2155 MHz, 2000-2020 MHz, and 2180-2200 MHz bands is subject to international agreements with Mexico and Canada.

25. Add § 27.65 to read as follows:

**§ 27.65 Acceptance of interference in 2000-2020 MHz.**

(a) Receivers operating in the 2000-2020 MHz band must accept interference from lawful operations in the 1995-2000 MHz band, where such interference is due to:

(1) The in-band power of any operations in 1995-2000 MHz (i.e., the portion transmit power contained in the 1995-2000 MHz band); or

(2) The portion of out-of-band emissions contained in 2000-2005 MHz.

(b) [Reserved].

**Subpart L—1710-1755 MHz, 2110-2155 MHz, 2000-2020 MHz, and 2180-2200 MHz bands**

26. Amend part 27 by revising the heading of subpart L to read as set forth above.

27. Add § 27.1103 to read as follows:

**§ 27.1103 2000-2020 MHz and 2180-2200 MHz bands subject to competitive bidding.**

Mutually exclusive initial applications for 2000-2020 MHz and 2180-2200 MHz band licenses are subject to competitive bidding. The general competitive bidding procedures set forth in 47 CFR part 1, subpart Q will apply unless otherwise provided in this subpart.

28. Add § 27.1104 to read as follows:

**§ 27.1104 Designated Entities in the 2000-2020 MHz and 2180-2200 MHz bands.**

Eligibility for small business provisions:

(a) Small business. (1) A small business is an entity that, together with its affiliates, its controlling interests, the affiliates of its controlling interests, and the entities with which it has an attributable material relationship, has average gross revenues not exceeding \$40 million for the preceding three years.

(2) A very small business is an entity that, together with its affiliates, its controlling interests, the affiliates of its controlling interests, and the entities with which it has an attributable material relationship, has average gross revenues not exceeding \$15 million for the preceding three years.

(b) Bidding credits. A winning bidder that qualifies as a small business as defined in this section or a consortium of small businesses may use the bidding credit specified in § 1.2110(f)(2)(iii) of this chapter. A winning bidder that qualifies as a very small business as defined in this section or a consortium of very small businesses may use the bidding credit specified in § 1.2110(f)(2)(ii) of this chapter.

29. Revise § 27.1131 to read as follows:

**§ 27.1131 Protection of Part 101 operations.**

All AWS licensees, prior to initiating operations from any base or fixed station, must coordinate their frequency usage with co-channel and adjacent channel incumbent, Part 101 fixed-point-to-point microwave licensees operating in the 2110–2155 MHz and 2180-2200 MHz bands. Coordination shall be conducted in accordance with the provisions of § 24.237 of this chapter.

30. Amend § 27.1134 by adding paragraph (e) to read as follows:

**§ 27.1134 Protection of Federal Government operations.**

\*\*\*\*\*

(e) Protection of Federal operations in the 2200-2290 MHz band. (1) Default emission limits. Except as provided in paragraph (e)(2) of this section, the following default out-of-band emissions limits shall apply for AWS-4 operations in the 2180-2200 MHz band.

(i) For these AWS-4 operations, the power of any emissions on all frequencies between 2200 and 2290 MHz shall not exceed an EIRP of -100.6 dBW/4 kHz.

(ii) No AWS-4 base station operating in the 2180-2200 MHz band shall be located less than 820 meters from a U.S. Earth Station facility operating in the 2200-2290 MHz band.

(2) Agreements between AWS-4 operators and Federal government entities. The out-of-band emissions limits in paragraph (e)(1) of this section may be modified by the private contractual agreement of licensees of AWS-4 operating authority and Federal government entities operating in the 2200-2290 MHz

band. Such agreement shall be transmitted to the Commission by the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce. A licensee of AWS-4 operating authority who is a party to such an agreement must maintain a copy of the agreement in its station files and disclose it, upon request, to prospective AWS-4 assignees, transferees, or spectrum lessees, to Federal operators, and to the Commission.

31. Add § 27.1136 to read as follows:

**§ 27.1136 Protection of mobile satellite services in the 2000-2020 MHz and 2180-2200 MHz bands.**

An AWS licensee of the 2000-2020 MHz and 2180-2200 MHz bands must accept any interference received from duly authorized mobile satellite service operations in these bands. Any such AWS licensees must protect mobile satellite service operations in these bands from harmful interference.

32. Amend § 27.1160 by revising the first sentence to read as follows:

**§ 27.1160 Cost-sharing requirements for AWS.**

Frequencies in the 2110–2150 MHz and 2160–2200 MHz bands listed in §101.147 of this chapter have been reallocated from Fixed Microwave Services (FMS) to use by AWS (as reflected in §2.106 of this chapter). \*\*\*

33. Amend § 27.1166 by revising paragraph (a)(1), paragraph (b) introductory text, and paragraphs (b)(2) and (f) to read as follows:

**§ 27.1166 Reimbursement under the Cost-Sharing Plan.**

(a) \*\*\*

(1) To obtain reimbursement, an AWS relocater must submit documentation of the relocation agreement to the clearinghouse within 30 calendar days of the date a relocation agreement is signed with an incumbent. In the case of involuntary relocation, an AWS relocater must submit documentation of the relocated system within 30 calendar days after the end of the relocation.

\*\*\*\*\*

(b) Documentation of expenses. Once relocation occurs, the AWS relocater, or the voluntarily relocating microwave incumbent, must submit documentation itemizing the amount spent for items specifically

listed in §27.1164(b), as well as any reimbursable items not specifically listed in §27.1164(b) that are directly attributable to actual relocation costs. Specifically, the AWS relocater, or the voluntarily relocating microwave incumbent must submit, in the first instance, only the uniform cost data requested by the clearinghouse along with a copy, without redaction, of either the relocation agreement, if any, or the third party appraisal described in (b)(1) of this section, if relocation was undertaken by the microwave incumbent. AWS relocators and voluntarily relocating microwave incumbents must maintain documentation of cost-related issues until the applicable sunset date and provide such documentation upon request, to the clearinghouse, the Commission, or entrants that trigger a cost-sharing obligation. If an AWS relocater pays a microwave incumbent a monetary sum to relocate its own facilities, the AWS relocater must estimate the costs associated with relocating the incumbent by itemizing the anticipated cost for items listed in §27.1164(b). If the sum paid to the incumbent cannot be accounted for, the remaining amount is not eligible for reimbursement.

\*\*\*\*\*

(2) Identification of links. The AWS relocater or the voluntarily relocating microwave incumbent must identify the particular link associated with appropriate expenses (i.e., costs may not be averaged over numerous links). Where the AWS relocater or voluntarily relocating microwave incumbent relocates both paths of a paired channel microwave link (e.g., 2110–2130 MHz with 2160–2180 MHz and 2130–2150 MHz with 2180–2200 MHz), the AWS relocater or voluntarily relocating microwave incumbent must identify the expenses associated with each paired microwave link.

\*\*\*\*\*

(f) Reimbursement for Self-relocating FMS links in the 2130–2150 MHz and 2180–2200 MHz bands.

Where a voluntarily relocating microwave incumbent relocates a paired microwave link with paths in the 2130–2150 MHz and 2180–2200 MHz bands, it may not seek reimbursement from MSS operators, but is entitled to reimbursement from the first AWS beneficiary for its actual costs for relocating the paired link, subject to the reimbursement cap in § 27.1164(b). This amount is subject to depreciation as specified in § 27.1164(b). An AWS licensee who is obligated to reimburse relocation costs under this

rule is entitled to obtain reimbursement from other AWS beneficiaries in accordance with §§27.1164 and 27.1168. For purposes of applying the cost-sharing formula relative to other AWS licensees that benefit from the self-relocation, depreciation shall run from the date on which the clearinghouse issues the notice of an obligation to reimburse the voluntarily relocating microwave incumbent.

34. Amend § 27.1168 by revising paragraph (a) introductory text, paragraphs (a)(2), (a)(3) introductory text, (a)(3)(ii), and (b) to read as follows:

**§ 27.1168 Triggering a reimbursement obligation.**

(a) The clearinghouse will apply the following test to determine when an AWS entity has triggered a cost-sharing obligation and therefore must pay an AWS relocater, MSS relocater, or a voluntarily relocating microwave incumbent in accordance with the formula detailed in §27.1164:

\*\*\*\*\*

(2) An AWS relocater, MSS relocater or a voluntarily relocating microwave incumbent has paid the relocation costs of the microwave incumbent; and

(3) The AWS or MSS entity is operating or preparing to turn on a fixed base station at commercial power and the fixed base station is located within a rectangle (Proximity Threshold) described as follows:

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(ii) If the application of the Proximity Threshold Test indicates that a reimbursement obligation exists, the clearinghouse will calculate the reimbursement amount in accordance with the cost-sharing formula and notify the AWS entity of the total amount of its reimbursement obligation.

(b) Once a reimbursement obligation is triggered, the AWS entity may not avoid paying its cost-sharing obligation by deconstructing or modifying its facilities.

35. Revise § 27.1170 to read as follows:

**§ 27.1170 Payment issues.**

Prior to initiating operations for a newly constructed site or modified existing site, an AWS entity is required to file a notice containing site-specific data with the clearinghouse. The notice regarding the new or modified site must provide a detailed description of the proposed site's spectral frequency use and

geographic location, including but not limited to the applicant's name and address, the name of the transmitting base station, the geographic coordinates corresponding to that base station, the frequencies and polarizations to be added, changed or deleted, and the emission designator. If a prior coordination notice (PCN) under §101.103(d) of this chapter is prepared, AWS entities can satisfy the site-data filing requirement by submitting a copy of their PCN to the clearinghouse. AWS entities that file either a notice or a PCN have a continuing duty to maintain the accuracy of the site-specific data on file with the clearinghouse. Utilizing the site-specific data, the clearinghouse will determine if any reimbursement obligation exists and notify the AWS entity in writing of its repayment obligation, if any. When the AWS entity receives a written copy of such obligation, it must pay directly to the relocater the amount owed within 30 calendar days.

36. Revise § 27.1174 to read as follows:

**§ 27.1174 Termination of cost-sharing obligations.**

The cost-sharing plan will sunset for all AWS and MSS entities on the same date on which the relocation obligation for the subject AWS band (i.e., 2110–2150 MHz, 2160–2175 MHz, 2175–2180 MHz, 2180–2200 MHz) in which the relocated FMS link was located terminates. AWS or MSS entrants that trigger a cost-sharing obligation prior to the sunset date must satisfy their payment obligation in full.

**PART 101— FIXED MICROWAVE SERVICES**

37. The authority citation for part 101 continues to read as follows:

Authority: 47 U.S.C. 154, and 303 unless otherwise noted.

38. Amend § 101.69 by revising paragraph (e) introductory text to read as follows:

**§ 101.69 Transition of the 1850–1990 MHz, 2110–2150 MHz, and 2160–2200 MHz bands from the fixed microwave services to personal communications services and emerging technologies.**

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(e) Relocation of FMS licensees by Mobile-Satellite Service (MSS) licensees will be subject to mandatory negotiations only.



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39. Amend § 101.73 by revising paragraph (a) and paragraph (d) introductory text to read as follows:

**§ 101.73 Mandatory negotiations.**

(a) A mandatory negotiation period may be initiated at the option of the ET licensee. Relocation of FMS licensees by Mobile Satellite Service (MSS) operators and AWS licensees in the 2110–2150 MHz and 2160–2200 MHz bands will be subject to mandatory negotiations only.

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(d) Provisions for Relocation of Fixed Microwave Licensees in the 2110–2150 and 2160–2200 MHz bands. A separate mandatory negotiation period will commence for each FMS licensee when an ET licensee informs that FMS licensee in writing of its desire to negotiate. Mandatory negotiations will be conducted with the goal of providing the FMS licensee with comparable facilities defined as facilities possessing the following characteristics:

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40. Amend § 101.79 by revising paragraphs (a) introductory text and (a)(2) to read as follows:

**§ 101.79 Sunset provisions for licensees in the 1850–1990 MHz, 2110–2150 MHz, and 2160–2200 MHz bands.**

(a) FMS licensees will maintain primary status in the 1850–1990 MHz, 2110–2150 MHz, and 2160–2200 MHz bands unless and until an ET licensee requires use of the spectrum. ET licensees are not required to pay relocation costs after the relocation rules sunset. Once the relocation rules sunset, an ET licensee may require the incumbent to cease operations, provided that the ET licensee intends to turn on a system within interference range of the incumbent, as determined by TIA TSB 10–F (for terrestrial-to-terrestrial situations) or TIA TSB 86 (for MSS satellite-to-terrestrial situations) or any standard successor. ET licensee notification to the affected FMS licensee must be in writing and must provide the incumbent with no less than six months to vacate the spectrum. After the six-month notice period has expired, the FMS licensee must turn its license back into the Commission, unless the parties have entered into an agreement

which allows the FMS licensee to continue to operate on a mutually agreed upon basis. The date that the relocation rules sunset is determined as follows:

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(2) For the 2180–2200 MHz band, for MSS/ATC December 8, 2013 (i.e., ten years after the mandatory negotiation period begins for MSS/ATC operators in the service), and for ET licensees authorized under part 27 ten years after the first part 27 license is issued in the band. To the extent that an MSS operator is also an ET licensee authorized under part 27, the part 27 sunset applies to its relocation and cost sharing obligations should the two sets of obligations conflict.

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41. Amend § 101.82 by revising paragraphs (a) and (d) to read as follows:

**§ 101.82 Reimbursement and relocation expenses in the 2110–2150 MHz and 2160–2200 MHz bands.**

(a) Reimbursement and relocation expenses for the 2110–2130 MHz and 2160–2200 MHz bands are addressed in §§ 27.1160–27.1174.

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(d) Cost-sharing obligations among terrestrial stations. For terrestrial stations (AWS), cost-sharing obligations are governed by §§ 27.1160 through 27.1174 of this chapter; provided, however, that MSS operators are not obligated to reimburse voluntarily relocating FMS incumbents in the 2180–2200 MHz band. (AWS reimbursement and cost-sharing obligations relative to voluntarily relocating FMS incumbents are governed by § 27.1166 of this chapter).

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